World Allergy Congress

WAC 2023

December 1-3, 2023
BANGKOK, THAILAND

Organized by:

Supported by:

Program & Abstracts Book
Welcome Message

On behalf of the World Allergy Organization (WAO), Allergy Asthma & Immunology Association of Thailand (AAIAT), and Asia Pacific Academy of Pediatric Allergy, Respirology & Immunology (APAPARI), we are delighted to welcome you warmly to the World Allergy Congress (WAC 2023) in Bangkok, Thailand, which will be on 1-3 December 2023.

WAC 2023 will provide participants with invaluable resources and strategies for enhancing their practices and the opportunity to learn about the newest scientific findings while discussing developments in the field with your peers. Moreover, this event will allow you to update your knowledge base in key areas of Allergy/Immunology with internationally renowned researchers, physicians, and allied health professionals.

We are pleased to invite all of you to be a part of this conference. The World Allergy Congress XXIX will offer three days of plenary, symposia, and workshop sessions for allergy/immunology specialists with special tracks for pediatrics, general practice, and food allergy. WAC 2023 will take place at Centara Grand & Bangkok Convention Centre at CentralWorld, located in the central area of Bangkok. With outstanding facilities to accommodate all Congress activities and many beautiful attractions to visit during your stay, you are sure to leave with new insights and friends as well as unforgettable memories.

We look forward to seeing you at the World Allergy Congress (WAC) – "Harmonizing Allergy Care: From Advances to Practice" in Bangkok, Thailand, in December 2023!

Bryan Martin, MD
WAO President

Hiroshi Chantaphakul, MD
AAIAT President

Kiat Ruxrunghtham, MD
AAIAT Past-President

Motohiro Ebisawa, MD, PhD
APAPARI President
Steering Committee & Scientific Committee

**Steering Committee**

- **Bryan L. Martin**
- **Hiroshi Chantaphakul**
- **Motohiro Ebisawa**
- **Ignacio Ansotegui**
- **Pantipa Chatchatee**
- **Wasu Kamchaisatian**
- **Mario Morais-Almeida**
- **Kiat Ruxrunghtham**
- **Pasuree Sangsupavanich**
- **Gary WK Wong**
Scientific Committee

Mario Morais-Almeida
Wasu Kamchaisatian
Ignacio Ansotegui
Jonathan A. Bernstein
Luis Caraballo

Yoon-Seok Chang
Hiroshi Chantaphakul
Manana Chikhladze
Adnan Custovic
Motohiro Ebisawa

Alessandro Fiocchi
Pedro Giavina-Bianchi
R. Maximiliano Gomez
Elham Hossny
Luciana Kase Tanno

Wiparat Manuyakorn
Bryan L. Martin
Jose Antonio Ortega-Martell
Nikolaos G. Papadopoulos
David B. Peden
Scientific Committee (Cont.)

Orathai Piboonpocanun
Philip W. Rouadi
Kiat Ruxrunatham
James L. Sublett
Lianglu Wang

Gary WK Wong
Organizing Committee

Local Organizing Committee

**Congress President**
Kiat Ruxrunghtham, MD

**Congress Vice-President**
Pasuree Sangsupawanich, MD

**Committee**
Pantipa Chatchatee, MD
Orathai Piboonpocanun, MD
Paisal Lerdluedeeporn, MD
Pongsakorn Tantilipikorn, MD
Supinda Chusakul, MD
Lina Ngamtrakulpanit, MD
Torpong Thongngarm, MD
Sira Nanthapisal, MD
Panitan Pradubpongsa, MD
Mongkol Lao-Araya, MD
Wannada Laisuan, MD
Somboon Chansakulporn, MD
Punchama Pacharn, MD

**Congress Co-President**
Hiroshi Chantaphakul, MD

**Committee & Secretary**
Wasu Kamchaisatian, MD

**Committee & Assistant Secretary**
Wiparat Manuyakorn, MD
Academic Subcomittee

Chair of Academic
Hiroshi Chantaphakul, MD

Co-Chair of Academic
Kiat Ruxrungtham, MD

Vice-Chair of Academic
Orathai Piboonpocanun, MD

Committee & Secretary
Wiparat Manuyakorn, MD

Academic
Kanokvalai Kulthanan, MD
Pantipa Chatchatee, MD
Pasuree Sangsupawanich, MD
Pongsakorn Tantilipikorn, MD
Kornkiat Snidvongs, MD
Wasu Kamchaisatian, MD
Narissara Suratannon, MD
General information

Venue: World Ballroom at 22nd-23rd Floor, Centara Grand & Bangkok Convention Centre at Centralworld, Bangkok, Thailand
999/99 Rama 1 Road, Pathumwan, Bangkok, Thailand
Tel. +66 (0)-2-100-1234  E-mail: cgcw@chr.co.th

Date: December 1-3, 2023

Registration:
Registration is required for all participants. Registration will entitle the participants to entrance to all scientific session, dinner symposium and sponsor exhibition area, and to lunch, opening ceremony and welcome reception, gala dinner and a meeting bag with a program and abstract book. An official name badge will be provided to every active participant. Please wear your name badge at all time since this is needed for entrance to all scientific sessions, lunch and all social events.

The registration desk is located near the ballrooms and operates during the following hours:
- Friday December 1, 2023: 7.30 – 17.00 hrs.
- Saturday December 2, 2023: 7.30 – 17.00 hrs.
- Sunday December 3, 2023: 7.30 - 17.00 hrs.

Mobile phone
Please silence all mobile phones during the scientific sessions.

Video-taping
Video-taping is strictly prohibited during all the scientific sessions.

Poster presentation area, coffee break and pharmaceutical exhibition
These are all located in Exhibitor Hall.
Floor Plan

World Ballroom 22nd Floor
Floor Plan (Cont.)

World Ballroom 23rd Floor
Floor Plan (Cont.)

Exhibition Hall
<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
<th>World Balcony A, F.23</th>
<th>Room 2</th>
<th>World Balcony A, F.23</th>
<th>Room 3</th>
<th>World Balcony C, R.23</th>
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<th>Lots 7, R.22</th>
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<th>Lots 5-6, R.22</th>
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**Scientific Program (Day 2)**

**Congress Day 2**
December 2, 2023

**World Allergy Congress 2023**

"Harmonizing Allergy Care: From Advances to Practice"

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<tr>
<td>8:30 - 10:00</td>
<td>Plenary: 1: Symposia: Immunotherapy: After 100 Years, Changes are At Hand</td>
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<td>- A paradigm shift toward antibiotic stewardship: David A. Khan, USA</td>
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**WAC 2023**

**World Allergy Congress 2023**

**San Diego, USA**

December 1-3, 2023

**Concurrent Hall A, R. 12**

**Scientific Program (Day 2)**

**Harmonizing Allergy Care: From Advances to Practice**

**Plenary: 2: Recent Advances in Asthma Management**

**Chairpersons: James M. Traynor, USA**

**Symposium 11**

**Title: What’s New in Asthma Management?**

**Moderator: James M. Traynor, USA**

**Speakers:**

- James M. Traynor, USA
- Louise Torres, USA
- Luisa Torres, USA
- Fabiana Cardinale, USA

**Publication Details:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal

**Symposium 12**

**Title: Asthma Symposia: Updated Concepts in Allergy**

**Chairpersons: James M. Traynor, USA**

**Symposia: Updated Concepts in Allergy**

**Moderator: Louise Simmons, USA**

**Speakers:**

- Louise Simmons, USA
- Fabiana Cardinale, USA
- Luisa Torres, USA
- Luisa Torres, USA

**Publication Details:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal

**Symposium 13**

**Title: Update on Asthma**

**Chairpersons: Fabiana Cardinale, USA**

**Reprints:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal

**Symposium 14**

**Title: New Concepts in Allergy**

**Chairpersons: Fabiana Cardinale, USA**

**Reprints:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal

**Symposium 15**

**Title: Future of Asthma**

**Chairpersons: Fabiana Cardinale, USA**

**Reprints:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal

**Symposium 16**

**Title: Future of Asthma**

**Chairpersons: Fabiana Cardinale, USA**

**Reprints:**

- Published in Allergy: Gry Weng, Hong Kong
- Lessons from the COVID-19 Pandemic: Elisabetta Nacciti, Italy
- The Future of Publishing and Editing: Philippe Oppenheim, Doris Kalbauer, PAI Journal
### Scientific Program World Allergy Congress 2023

#### "Harmonizing Allergy Care: From Advances to Practice"

<table>
<thead>
<tr>
<th>Time</th>
<th>Room 1</th>
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<td>8.30 - 10.00</td>
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<td>Congress Day 3</td>
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<td>December 3, 2023</td>
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<tr>
<td>Plenary 5: Airway Allergy: New Treatments to Practice</td>
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<td>Chairpersons: Mario Moras-Almendà, Hiroshi Chantaphakul</td>
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<td>Convention Hall A, F122</td>
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<tr>
<td>Difficulty to Control Airway Allergy: Comorbidity Matters!</td>
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<td>Kit Ruengruchy, Thailand</td>
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<tr>
<td>Biologies in Allergic Lower Airway Diseases</td>
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<td>Paul O’Brien, Canada</td>
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<td>Biologies in Allergic Upper Airway Diseases</td>
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<td>De Yun Wang, Singapore</td>
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<td>Room 1</td>
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<td>10.30 - 11.45</td>
<td>Symposium 17</td>
<td>Symposium 18</td>
<td>Symposium 19</td>
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<tr>
<td>Chairpersons: Pantipa Chatchate, Lynette Shrik</td>
<td>Sangklot Anumjaturatag, Yoos-See Kham</td>
<td>SISTER Society Symposium: IASA</td>
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<tr>
<td>Hot Topics In Food Allergy</td>
<td>Update in Rhinoinstills &amp; Nasal Polyps</td>
<td>Moderator: Motocha Eviskia</td>
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<tr>
<td>- WAO Food Allergy Initiative: Alessandro Focchi, Italy</td>
<td>-Pathophysiology of Atopic Dermatitis and Oral Polyps</td>
<td>Progress in Pathophysiology and Management of Asthma</td>
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<tr>
<td>- PRACTALL Revision on Food Allergy Management: Philippe Eigendermann, Switzerland</td>
<td>- Current and Emerging Treatment Options for CRSwNP: Konki Kist</td>
<td>- Asthma biomarkers: Jujung Salai, Japan</td>
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<tr>
<td>- Food Allergy in Asia: A different spectrum: Agnes Leung, Hong Kong</td>
<td>- Role of Biologics and beyond for CRSwNP: Huang, China</td>
<td>- Tinosporic inflammation in allergic diseases: Manash Kada, Japan</td>
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<tr>
<td>12.00 - 13.00</td>
<td>Industry Symposium &amp; Messehall</td>
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<td>13.00 - 13.45</td>
<td>Tip &amp; Trick in Allergy 2</td>
<td>Hot Topics 3</td>
<td>Interactive Workshop 4</td>
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<tr>
<td>Moderators: Nualnaiong Vilvisutninthorn, Hyo-Bin Kim</td>
<td>Chairpersons: SK Kanchaithan, Elham Hosseini</td>
<td>Moderators: Marylin Valentin Rosat, Y Maureen Umita-Pereira</td>
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<td>Optimal Diagnosis in Food Allergy</td>
<td>Hereditary Angioedema Care in Resource Limited</td>
<td>- New Therapeutics Options in Atopic Dermatitis: Isabel Rojo, Mexico</td>
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<td>-From History to Skin Testing: Felicia Naquiel S. Tayag, Philippines</td>
<td>- Adopting I A E Guideline to Patients Care: Pedro Giovanni Bianchi, Brazil</td>
<td>- Asthma Surveys in Latin America: Anahy Yanez, Argentina</td>
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<td>- Allergy Blood Testing: Food IgE, CI4D and Beyond: Araya Tuyen Nguyen, Thailand</td>
<td>- Overcoming Challenges in Diagnosis of I A E:</td>
<td>- The Human Microbiome of Latin America Populations: Changes in Immune Modulation: Pablo Moreno, Argentina</td>
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<td>14.00 - 15.15</td>
<td>Symposium 20</td>
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<td>Symposium 23</td>
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<td>Chairpersons: Pasunke Sangsupvanich, Pablo Moreno</td>
<td>Chairpersons: Wasi Kanchaithan, Young-Koo Jee</td>
<td>Chairpersons: Suporn Trepangkaranon, Sakura Sato</td>
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<tr>
<td>Microbiomes and Allergy</td>
<td>Biologics &amp; Biomarkers in Allergic Diseases</td>
<td>Recent Advances in non-IgE-Mediated Food Allergy</td>
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<tr>
<td>- The environment and oral microbiome in allergic disease: Lynette Shrik, Singapore</td>
<td>- Biologic in Rhinitis: Hiroshi Chantaphakul, Thailand</td>
<td>- Immune mechanisms of Food Protein-induced Enterocolitis Syndrome (FPES): Anna H. Nowak-Wegrzyn, USA</td>
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<td>- Epigenetic signature link microbiota and allergic diseases: Luis Caraballo, Colombia</td>
<td>- Omics and Biomarkers for understanding Food Allergy: Agnes Leung, Hong Kong</td>
<td>- The Varieties of non-IgE mediated Food Allergy: FFPAP, FPE to EU888 Vorenaut Chiangmai, Thailand</td>
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<td>15.15 - 15.45</td>
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<td>15.45 - 17.00</td>
<td>Symposium 24</td>
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<td>Symposium 26</td>
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<tr>
<td>Anaphylaxis &amp; Mast Cell Disorders</td>
<td>Atopic Dermatitis: From Phenotype to Treatments</td>
<td>Controversies in Allergy</td>
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<tr>
<td>- Coding of Anaphylaxis diagnosis in ICD-11:</td>
<td>- Role of barrier dysfunction and allergic sensitization in development of AD: Helen A. Brough, UK</td>
<td>Moderators: Ana Morete, Bryan L. Martin</td>
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<td>Luciana Kase Tanno, Brazil</td>
<td>- How to predict and prevent the early-onset phenotype of atopic dermatitis in Infants: Kanggo An, South Korea</td>
<td>- Androgens in IGA: patients’ friends or foes? Manuel Bruno Ferrera, Portugal</td>
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<td>James L. Sulavett, USA</td>
<td>- Digital health: now and future in respiratory allergy: Federico Negatina, Portugal</td>
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<td>Anaphylaxis management in young children: Michael Levin, South Africa</td>
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#### Closing Ceremony, World Ballroom B

17.00 - 17.30
## Industry Symposium (Day 1)

<table>
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<tr>
<th>Time</th>
<th>Congress Day 1 (December 1, 2023)</th>
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| 12.00 - 13.00| **Industry Symposium 1** - GSK @ World Ballroom B, fl.23 (Room 1)  
“Mastering Asthma Remission in Moderate – Severe Asthma”  
Speakers: Hiroshi Chantaphakul, Thailand  
Paul Jones, UK |
| 12.00 - 13.00| **Industry Symposium 2** – Takeda @ World Ballroom A, fl.23 (Room 2)  
“Navigating the patient journey: HAE diagnosis and management”  
Moderator: Hilary Longhurst, New Zealand  
Speakers: Hilary Longhurst, New Zealand  
Andrea Zanichelli, Italy |
| 12.00 - 13.00| **Industry Symposium 3** – Danone @ Convention Centre A, fl.22  
“The new era of CMPA management targeting gut microbiota”  
Moderator: Jarungchit Ngamphaiboon, Thailand  
Speakers: Udo Herz, Netherlands  
Anna H. Nowak-Wegrzyn, USA  
Pantipa Chatchatee, Thailand |
| 12.00 - 13.00| **Industry Symposium 4** – MSD @ Lotus 5-6, fl.22 (Room 4-5)  
“Refractory and unexplained chronic cough: A disease on its own”  
Moderator: Bryan L. Martin, USA  
Speakers: Mario Morais-Almeida, Portugal  
Philip W. Rouadi, Kuwait  
Ignacio J. Ansotegui, Spain |
| 13.00 - 13.45| **Mini-Satellite Symposium 1** – GSK @ Lotus 5-6, fl.22 (Room 5)  
“Future Prospects of Immunization in Allergy and Airway Diseases Management”  
Moderator: Hiroshi Chantaphakul, Thailand  
Speakers: Sira Nanthapisal, Thailand  
Olakunle Oladehin |
| 16.00 - 16.30| **Mini-Satellite Symposium 2** – Pfizer @ Lotus 7, fl.22 (Room 4)  
“The noval therapies for Moderate-to-severe atopic dermatitis patient”  
Moderator: Wasu Kamchaisatian, Thailand  
Speaker: Torsten Zuberbier, Germany |
| 16.40 - 17.10| **Mini-Satellite Symposium 3** – Eurodrug @ Lotus 7, fl.22 (Room 4)  
“ICS reduction strategies in Pediatric Asthma”  
Moderator: Ignacio Ansotegui, Spain  
Speaker: Alessandro Fiocchi, Italy  
Sandra Gonzalez, Mexico |
# Industry Symposium (Day 2)

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<th>Time</th>
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| 12.00 - 13.00 | **Industry Symposium 5 – Sanofi @ World Ballroom B, fl.23 (Room 1)**  
“Updating Allergy Management”  
**Moderator:** Bryan Martin, USA  
**Speaker:**  
- Ignacio J. Ansotegui, Spain  
- Anne K. Ellis, Canada  
- Jose Antonio Ortega Martell, Mexico |
| 12.00 - 13.00 | **Industry Symposium 6 - Astra-Zeneca @ World Ballroom A, fl.23 (Room 2)**  
“Remission in severe asthma an achievable treatment goal in the biologics era”  
**Speaker:**  
- Paul O'Byrne, Canada  
- Hiroshi Chantaphakul, Thailand |
| 13.00 - 13.30 | **Mini-Satellite Symposium 4 – Novartis @ Lotus 7, fl.22 (Room 4)**  
“Anti-IgE in IgE-Related Chronic Diseases”  
**Speakers:** Hiroshi Chantaphakul, Thailand |
| 13.30 - 14.00 | **Mini-Satellite Symposium 5 – Organon @ Lotus 7, fl.22 (Room 4)**  
"LTRA in Asia: Unveiling Efficacy and Safety Insights"  
**Moderator:** Pantipa Chatchatee, Thailand  
**Speakers:** Hyo-Bin Kim, South Korea |
| 16.00 - 17.15 | **Satellite Symposium – Ferrero @ Lotus 7, fl.22 (Room 4)**  
“Hunger in the midst of abundance: regulating precautionary allergen labelling”  
**Moderators:**  
- Motohiro Ebisawa, Japan  
- Bryan L. Martin, USA  
**Speakers:**  
- Gary Wong, Hong Kong  
- Alessandro Fiocchi, Italy  
- Linda Monaci, Italy |
# Industry Symposium (Day 3)

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| 12.00 - 13.00 | **Industry Symposium 8 - Menarini** @ World Ballroom B, fl.23 (Room 1)  
“Place in therapy of Bilastine: from guidelines to real-life”  
**Moderator:** Hiroshi Chantaphakul, Thailand  
**Speakers:**  
- Walter Canonica, Italy  
- Jean Bousquet, France  
- Hiroshi Chantaphakul, Thailand |
## Oral Presentation

**OAS 1: Dec 1, 2023 (13-13.45)**

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## Advanced computational system for detection and analysis of coughing.

**Presenter First Name:** Pawel  
**Presenter Last Name:** Miotla  
**Country:** POLAND

## Viral Hepatitis affecting a female teenager with a debuting Type 3 Polyglandular Autoimmune Syndrome: a serendipitous Case Report

**Presenter First Name:** Raúl Alberto  
**Presenter Last Name:** Montero Vázquez  
**Country:** MEXICO

## Perception and experience of medical professionals regarding allergy practices through hybrid learning techniques in India: A cross-sectional study

**Presenter First Name:** Balachandra  
**Presenter Last Name:** B V  
**Country:** INDIA

## Vitamin D Deficiency as a Risk Factor for Head and Neck Cancer in dr. Hasan Sadikin Hospital Bandung

**Presenter First Name:** Melati  
**Presenter Last Name:** Sudiro  
**Country:** INDONESIA
ORAL ABSTRACT PRESENTATION

OAS 1: Dec 1, 2023 (13.00-13.45)
WAC23-0061
An observational birth cohort study an observational birth cohort study on the association between skin barrier dysfunction and allergen sensitization in infancy (Fukushima Study)

Professor Naoki Shimojo¹, Assistant Professor Ryo Takemura², Professor Michihiro Kono³, Dr. Yoko Ichikawa⁴, Mrs. Seiko Tanaka⁵, Mr. Yutaka Koyano⁵, Mrs. Misa Fujinami⁵

¹Pediatrician, Center for Preventive Medical Sciences Chiba University
²Biostatistician, Keio University Hospital
³Dermatologist, Akita University
⁴Pediatrician, Ichikawa Clinic
⁵researcher, Natural Science Co., Ltd.

Background: In recent years, atopic dermatitis (AD) has been considered a major cause of allergen sensitization via skin barrier disruption. However, it has also been reported that moisturizing from early infancy decreases AD but does not prevent food allergy (FA) or allergen sensitization. We aimed to determine the relationship between skin barrier dysfunction and allergen sensitization in infants receiving skin care using a prospective birth cohort observational study.

Methods: Neonates born at a maternity hospital in Fukushima, Japan, received continuous skin care (washing and moisturizing) from immediately after birth until 1 year of age. Transepidermal water loss (TEWL) was measured after a few days and at 1, 4, and 6 months of age. Allergen sensitization was assessed by ImmnoCAP at 6 months and 1 year of age.

Result: A total of 177 neonates were followed up until 1 year of age; only a few neonates developed AD and FA by 1 year of age. In contrast, 56 (31.6%) infants were sensitized to egg white at 6 months and 70 (39.5%) at 1 year of age. Statistical analysis showed that increased TEWL by 1 month of age was positively correlated with sensitization to egg white at 6 months (Cochran-Armitage trend test, p = 0.0157); infants with the FLG mutation had a higher rate of sensitization than infants without the FLG mutation (Chi-square test, p = 0.0248).

Conclusion: Even in children without apparent AD, impaired skin barrier function in early infancy is associated with subsequent food sensitization.
WAC23-0106
Efficacy and safety of dupilumab in children aged 6 months to 5 years with atopic dermatitis with and without type 2 comorbidities

Dr. Nicholas Lim¹, Dr. Zhen Chen², Dr. Ainara Rodríguez Marco³, Dr. Mark Boguniewicz⁴, Dr. Amy Paller⁵, Dr. Lawrence Sher⁶, Dr. Parul Shah⁷

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²Director, Medical Analytics, Regeneron Pharmaceuticals Inc., Tarrytown, NY, USA
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⁴Pediatric Allergist & Immunologist, National Jewish Health, Denver, CO, USA; University of Colorado School of Medicine, Denver, CO, USA
⁵Pediatric Dermatologist, Northwestern University Feinberg School of Medicine, Chicago, IL, USA; Ann and Robert H. Lurie Children’s Hospital, Chicago, IL, USA
⁶Pediatrician, Peninsula Research Associates, Rolling Hills Estates, CA, USA
⁷Senior Director, Medical Affairs, Regeneron Pharmaceuticals Inc., Tarrytown, NY, USA

Background: Atopic dermatitis (AD) is a chronic, inflammatory, systemic disease that frequently occurs with type 2 comorbidities, including allergic rhinitis, adding to patient burden.

Methods: In LIBERTY AD PRESCHOOL (NCT03346434 part b), a double-blind, 16-week, phase 3 trial, 162 children aged 6 months to 5 years were randomized 1:1 to receive dupilumab (n = 83) every 4 weeks based on baseline weight (200 mg: ≥ 5 to < 15 kg; 300 mg: ≥ 15 to < 30 kg) or placebo (n = 79) with concomitant low-potency topical corticosteroids (TCS). Type 2 comorbidity history was ascertained by caregiver report.

Result: At Week 16, significantly more patients receiving dupilumab vs placebo achieved Investigator’s Global Assessment score of 0/1, regardless of allergic rhinitis diagnosis (with: 24.3% vs 0.1%; without: 30.4% vs 7.2%). At Week 16, significantly more patients receiving dupilumab vs placebo achieved ≥ 75% improvement in Eczema Area and Severity Index with allergic rhinitis (54.1% vs 3.2%) and without allergic rhinitis (52.2% vs 17.3%). In placebo-treated patients, serious and severe treatment-emergent adverse events (TEAEs) were reported in patients with allergic rhinitis (3 [8.1%]; 6 [16.2%]) and without allergic rhinitis (1 [2.4%]; 4 [9.8%]). Two (4.3%) dupilumab-treated patients without allergic rhinitis reported severe TEAEs. One (2.7%) placebo-treated patient with allergic rhinitis and one (2.2%) dupilumab-treated patient without allergic rhinitis reported a TEAE that led to drug discontinuation.

Conclusion: Dupilumab with TCS was equally efficacious in improving AD signs in children aged 6 months to 5 years with and without a history of type 2 comorbidities.
WAC23-0180
Biomarker analysis identifies subset of atopic dermatitis patients that respond to IL-33 blockade

Dr. Michael Howell ¹, Dr. Someit Sidhu ², Dr. Chris Cabell ³, Dr. Brandon Strong ⁴, Mr. Jackson Cabell⁵

¹ Chief Scientific Officer, Zura Bio
² Chief Executive Officer, Zura Bio
³ Chief Medical Officer, Zura Bio
⁴ Executive Director, Zura Bio
⁵ Statistician, Zura Bio

Background: Atopic dermatitis (AD) is a chronic skin disease characterized by Th2-mediated inflammation, allergen sensitization, microbial invasion, and intense pruritus. Interleukin-33 (IL-33) is released by epithelial cells following cellular damage and binds to a heterodimer receptor consisting of ST2 and IL-1RAcP to induce cellular mediators, including IL-4, IL-5, and IL-13. Torudokimab (anti-IL-33) is a human IgG4 monoclonal antibody that was evaluated in a phase II clinical study (NCT03831191) of moderate-to-severe AD. This study characterized clinical participants that experienced rapid and significant therapeutic benefit with torudokimab.

Methods: Enrolled participants that completed visits through week 8 of the study were included in this analysis. Analysis parameters included changes in disease severity (SCORAD) and peripheral biomarkers. A 25% improvement in disease severity from baseline to week 8 was used to stratify participants into responder/non-responder populations.

Result: 97 (71.3%) participants completed 8 weeks of treatment. SCORAD improved in a dose-dependent manner; however, it did not reach statistical significance. 26.1% (6 out of 23) of placebo, 29.6% (8/27) of 50mg; 28% (7/25) of 150mg, and 36.4% (8/22) of 600mg treated participants achieved >25% improvement in SCORAD at week 8. Improvement corresponded with reductions in circulating IL-13, CCL17/TARC, and perioistin levels. Finally, broad proteomic analysis between responder and non-responder participants identified several proteins which were statistically differentiated at baseline before therapeutic intervention.

Conclusion: Retrospective analysis identified a subset of AD patients that experienced a significant therapeutic benefit by 8 weeks. Additionally, exploratory analysis identified potential pharmacodynamic and predictive biomarkers for use in future trials.
WAC23-0214
Association between eczema and clinical, biophysical and cutaneous microbial factors: Findings from a Chinese birth cohort

Professor Ting Fan Leung¹, Assistant Professor Agnes Sze Yin Leung², Associate Professor Zigui Chen³, Dr. Oi Man Chan⁴, Miss Yat Laam Lee⁵, Dr. Nam Sze Cheng⁶, Miss Vivian Sze Wai Yu⁶, Miss Yee Kwan Ho⁶, Dr. Jinpao Hou⁷, Professor Ting Fan Leung⁸, Professor Stephen Kwok Wing Tsui⁸, Dr. Man Fung Tang⁹

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²Assistant Professor, Chinese University of Hong Kong
³Associate Professor, Chinese University of Hong Kong
⁴Clinical Lecturer, Chinese University of Hong Kong
⁵MPhil student, Chinese University of Hong Kong
⁶Nurse, Chinese University of Hong Kong
⁷Postdoctoral Fellow, Chinese University of Hong Kong
⁸Professor, Chinese University of Hong Kong
⁹Research Associate, Chinese University of Hong Kong

Background: Background: Eczema usually manifests within 6 months of age with diverse pattern for persistence. Factors predicting such changes in disease status remain unclear. This study aimed to identify clinical, biophysical and skin microbial factors that were associated with infantile eczema.

Methods: Methods: 166 Chinese infants recruited regardless of familial allergy history were assessed at birth, 1, 3, 6 and 12 months of age. Eczema was diagnosed by Hanifin and Rajka criteria. Skin hydration (SH) and trans-epidermal water loss (TEWL) were measured at the above time points, while skin prick test was performed at 12 months. Flocked skin swabs were collected prospectively at both antecubital fossae for 16S rRNA sequencing. Associations between eczema outcomes and clinical and biophysical factors were analyzed by logistic regression. The effects from skin biophysical and microbiota were analyzed by generalized estimating equations.

Result: Seventy-one (43%) subjects had eczema, which resolved in 38 (54%) by 12 months. Eczema was associated with atopy (aOR 3.0, P=0.012). SH (9.6 vs 37.5, P<0.001) and TEWL (6.4 vs 9.4, P<0.001) were lower at baseline and reached plateau from one month. Nonetheless, there was no significant difference for SH or TEWL between eczema and controls. For skin microbiome, both alpha and beta diversity indices increased significantly from birth to 12 months. However, their trajectories were not different between babies with and without eczema.

Conclusion: Eczema is associated with atopy at 12 months. Neither biophysical measurements nor skin microbiota is predictive biomarker for early-onset eczema. (funded by Health and Medical Research Fund [reference 06170466]
**WAC23-0277**  
**Multi-omics Analysis of the Maternal Pro-inflammatory Microbiome and Metabolome Signatures in Relation to Infantile Eczema – SPRESTO**

Dr. Le Duc Huy Ta¹, Mrs. Gaik Chin Yap¹, Dr. Chiung-Hui Huang¹, Professor Anne Goh², Dr. Oon Hoe Teoh², Professor Bee Wah Lee³, Dr. Elizabeth Huiwen Tham⁴, Professor Lynette P.C Shek⁴, Professor Hugo P. S. Van Bever⁴, Professor Keith M. Godfrey⁵, Professor Yap-Seng Chong⁶, Professor Eric Chun Yong Chan⁷, Dr. Evelyn Xiu Ling Loo⁸, Dr. Neerja Karnani⁸, Dr. James Chun Yip Chan⁹

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²Clinician, Department of Paediatrics, KK Women’s and Children’s Hospital, Singapore  
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⁵Clinician, MRC LifeCourse Epidemiology Unit and NIHR Southampton Biomedical Research Centre, University of Southampton and University Hospital Southampton NHS Foundation Trust, Southampton, UK  
⁶Clinician, Singapore Institute for Clinical Sciences (SICS), Agency for Science, Technology and Research (A*STAR), Singapore, Singapore & Department of Obstetrics & Gynaecology, National University of Singapore, Singapore  
⁷Scientist, Department of Pharmacy, Faculty of Science, National University of Singapore, Singapore & Innovations in Food & Chemical Safety Programme, A*STAR  
⁸Scientist, Singapore Institute for Clinical Sciences (SICS), Agency for Science, Technology and Research (A*STAR), Singapore, Singapore  
⁹Scientist, Skin Research Institute of Singapore, Singapore Institute for Clinical Sciences (SICS), Agency for Science, Technology and Research (A*STAR), Singapore

**Background:** Atopic dermatitis (AD) is the commonest chronic inflammatory skin disease in children. The aim of this study was to identify putative stool/plasma metabolome/microbiome signatures of prenatal mothers and their AD infants and define the risk phenotypes that predispose to AD in early life.

**Methods:** We leveraged on a case-control sub-cohort of AD (n=64) and controls (n=64) selected from the Singapore Preconception Study of Long-Term Maternal and Child Outcomes (S-PRESTO) cohort consisting of maternal-child dyads in which clinical atopic eczema outcomes in offspring were evaluated longitudinally till 18 months of age. Maternal stool microbiota and metabolomic signatures at 1st trimester, 3rd trimester of pregnancy, and their offsprings’ at week 3 and month 3 were analyzed by metagenomics sequencing and liquid chromatography-mass spectrometry respectively.
**Result:** We observed systemic pro-inflammatory milieu in the mothers of AD infants as characterized by metabolome and microbiome perturbations including (1) a decrease in stool anti-inflammatory valeric acid at 1st and 3rd trimester of pregnancy; (2) increased plasma levels of pro-inflammatory branch-chained amino acids (leucine, isoleucine and valine) and mitochondrial oxidation by-products (alpha-ketoglutarate) and (3) an enrichment of stool pathogenic Klebsiella pneumoniae at 3rd trimester of pregnancy. This maternal signature was associated with a decrease in valeric acid, Bacteroides fragilis, Bacteroides stercoris and Bacteroides uniformis and an increase of Klebsiella pneumoniae and Escherichia coli at week 3 and month 3 in AD infants.

**Conclusion:** Our findings provide novel evidence of a constellation of pro-inflammatory signatures identified during the prenatal period and at birth that is associated with AD in offspring.
ORAL ABSTRACT PRESENTATION

OAS 2: Dec 1, 2023
(17.15-18.00)
WAC23-0105
Algorithm for treatment of pregnant women with syphilis and history of allergy to penicillin effectiveness and safety

Miss Bruna Gehlen¹, Miss Bruna Gehlen¹, Dr. Juliana Fóes Bianchini Garcia¹, Mrs. Nathalia Coelho Portilho¹, Assistant Professor Marcelo Vivolo Aun¹, Professor Jorge Kalil¹, Associate Professor Pedro Giavina-Bianchi¹

¹Allergist and Immunologist, Clinical Immunology and Allergy Division, University of São Paulo, Brazil.

Background: Penicillin is the only proven effective treatment for pregnant women with syphilis. The objectives of the study were: 1. To evaluate the efficacy and safety of an algorithm to guide re-exposure to penicillin in pregnant women with syphilis and a history of allergy to the drug; 2. Identify possible biomarkers of the desensitization outcome.

Methods: According to risk stratification, pregnant women with syphilis and a history of immediate hypersensitivity reaction to penicillin were re-exposed to penicillin through rapid desensitization or drug provocation test. Patients with high-risk clinical history for anaphylaxis, or with positive skin testing were desensitized.

Result: The study included 165 patients. Eighty-one (49.1%) had high-risk clinical history for anaphylaxis and were desensitized, while 84 with low-risk and negative skin testing underwent challenge. Intradermal tests were positive in 6.7% of all patients. These patients underwent desensitization, and nine of them had reactions during desensitization. There was an association between positive intradermal test and reaction during desensitization (p<0.0001), and all but one patient with negative testing had silent procedures. Only two patients had positive serum specific IgE, one reacting to penicillin reexposure. The eighty-four patients (50.9%) considered to be at low risk were challenged, with only three reacting (3.6%). Allergy to penicillin was confirmed in 9.7% of our patients. The efficacy of the algorithm was 98.8%, and the safety was 92.1%.

Conclusion: The present algorithm for managing immediate reactions to penicillin is effective and safe. The intradermal test identifies patients at higher risk for reactions during desensitization.
Prevalence of possible pathogenic variants in genes related to Hereditary angioedema (HAE) from Genomic Thailand, the Thailand initiative on whole genome sequencing in health and disease Thai population

WAC23-0270

Assistant Professor Sira Nanthapisal¹, Assistant Professor Sira Nanthapisal¹, Assistant Professor Narissara Suratannon², Assistant Professor Watcharoot Kanchongkittiphon³, Dr. Chamard Wongsaw⁴, Assistant Professor Wannada Laisuan⁵, Dr. Sissades Tongsima⁶, Dr. Vorthunju Nakhonsri⁷, Dr. Chumpol Ngamphiw⁷

¹Lecturer, Faculty of Medicine, Thammasat University, Thailand
²Lecturer, Center of Excellence for Allergy and Clinical Immunology, Division of Allergy, Immunology and Rheumatology, Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
³Lecturer, Department of Pediatrics, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
⁴Lecturer, Division of Allergy and Clinical Immunology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand
⁵Lecturer, Division of Allergy Immunology and Rheumatology, Department of Medicine, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand
⁶Scientist, National Biobank of Thailand, National Center for Genetic Engineering and Biotechnology, Pathum Thani, Thailand
⁷Scientist, National Biobank of Thailand, National Center for Genetic Engineering and Biotechnology, Thailand

Background: Prevalence of HAE in Thailand was unknown. We explored the prevalence of variant in known genes related to HAE in Genomics Thailand, an initiative for population based genetic study.

Methods: Genomic DNA was extracted from peripheral blood samples and sequenced using the BGI DNBSEQ-T7. Bioinformatics analyses were performed following GATK4.0 best practice. TAPES was employed to systematically categorize the pathogenicity of variants.

Result: The analysis included 15,629 subjects, unveiling 2 heterozygous variants in SERPING1 which related to HAE with abnormal C1-esterase inhibitor (C1-INH), 6 in KNG1 and 1 in PLG. Variants in SERPING1, C.1198C>T;p.Arg400Cys (rs201363394) and c.387_388delCT;p.Cys130LeufsTer2, were designated as likely pathogenic according to ACMG criteria. The C.1198C>T;p.Arg400Cys variant, a scarcely observed hypomorphic allele, diminished C1-INH function and was previously detected in a HAE patient. The newly identified c.387_388delCT;p.Cys130LeufsTer2 variant represents a novel alteration causing a frameshift and early termination codon in exon 3/8 which potentially affect C1-INH level. Variants in KNG1 and PLG are novel and frameshift
variants except one missense variant in KNG1. However, clinical data for the subjects carrying these variants has yet to be determined.

**Conclusion:** The prevalence of possible pathogenic variants in SERPING1 from Genomic Thailand was 1.27:10,000. Hence, the estimated number of Thai people that might carry pathogenic variant in SERPING1 was approximately 800. Prevalence of pathogenic variants in KNG1 and PLG are 3.2:10,000 and 0.6:10,000 respectively. However, variants in these genes do not relate only to HAE. This approach was solely based on bioinformatic analysis regardless of clinical information at enrollment which may lead to overestimation.
WAC23-0291
Genome-wide association study of NSAIDS hypersensitivity in Vietnamese population

Assistant Professor Dinh Van Nguyen¹, Dr. Nhu Nguyen², Dr. Thi Hang Vu², Dr. Chi Hieu Chu³, Dr. Quynh Anh Nguyen⁴, Dr. Thi Mai Vu⁴, Dr. Thi Hai Yen Pham⁴, Miss Thi Ha Trang Tran⁵, Mr. Le Nam Nguyen⁵, Mr. Tien Minh Pham⁵, Dr. Van Khiem Nguyen⁶, Mr. Van Thang Nguyen⁷, Dr. Quynh Lan Phan⁷, Miss Hoang Mai Tran⁸, Dr. Sy Nam Vo⁸

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²Allergist, Bach Mai Hospital
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Background: Non-steroidal anti-inflammatory drugs (NSAIDs), the most frequently used medications, have related to higher incidence of adverse reactions (type A) and hypersensitivity reactions (Type B). Currently, a number of genes and single nucleotide polymorphisms (SNPs) have been determined to be associated with increasing the risk of COX-1 inhibition in NSAIDs hypersensitivity in different populations such as Korean, Japanese, Chinese and Spanish. The arachidonic acid (AA) metabolism which contains ALOX5, Cysteine leukotriene receptors, Prostaglandin D receptor, Thromboxane-A1 synthase, CEP68 and Diamine oxidase is reported association with NSAIDS hypersensitivity. However, they are ethnic specific or NSAIDs hypersensitivity specific.

Methods: We performed a genome-wide association study (GWAS) and targeted association study to identify genetic factors associated with NSAIDS hypersensitivity in Vietnamese. A total of 149 cases with COX-1 related NSAIDS hypersensitivity and 908 unrelated controls using genotyping (850K markers) and whole genome sequencing data were collected.

Result: GWAS revealed the top-ranked variant in 3' regions of the ALOX5 gene at the position of rs34731408 (p=2,011 x 10-11, OR= 4,969) but not the other genes in AA pathway. In the targeted association study, we obtained suggestive associations for three clusters including HLA genes (HLA-B, HLA-C and HLA class II genes), NLRP3 and EMID2. Interestingly, GWAS data showed that rs9272272 in HLA-DQA1 (p-value 10 – 11, OR: 0,297) could be a protective marker specific for Vietnamese suggesting a new genetic signature of population in comparison with other East Asian populations.

Conclusion: The study reveals the importance of the ALOX5 gene and HLA genes of NSAIDS hypersensitivity in Vietnamese.
Three-year comparison between high- and low-dose oral immunotherapy in children with severe cow’s milk allergy

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Background: We compared the 3-year safety and efficacy of oral immunotherapy with high (HOIT) or low (LOIT) maintenance dose for patients with severe cow’s milk allergy.

Methods: Patients aged 6 years or older who reacted to 3 mL or less of milk and received OIT were included. Patients received HOIT from 2009 to 2012, and patients received LOIT from 2013 to 2019. The HOIT group increased their ingestion up to 200 mL in the first year and thereafter. The LOIT group ingested up to 3 ml in the first year and gradually increased ingestion up to 100 mL in the second and third years. The patients’ guardians recorded daily adverse reactions in a diary.

Result: In the HOIT (n=79) and LOIT (n=100) groups, median ages were 8.2 and 7.8 years, milk-specific IgE levels were 56.4 and 47.6 UA/mL, and proportion of patients with a history of anaphylaxis were both 99%, respectively. The baseline characteristics, excluding total IgE, were not significantly different between both groups. The rate of adverse reactions per patient per dose was significantly higher in the HOIT group than in the LOIT group during the 1st, 2nd, and 3rd year (24%, 18%, and 9% vs. 13%, 9%, and 6%, p<.001, respectively). After three years, 75% and 75% in the HOIT group and 47% and 8% in the LOIT group were able to ingest 25 mL and 100 mL of milk (p<.001).

Conclusion: LOIT protocol markedly improved safety and sustainability. HOIT was more effective in 3-year follow-up.
WAC23-0353
Role of pectate lyases in allergy to tree and weed pollens

Dr. Victoria Rodinkova1, Dr. Lawrence DuBuske1

1Allergy and Immunology, Director, Immunology Research Institute of New England, Gardner, MA, United States of America

Background: Pectate lyases are present in pollen of trees and weeds including the major allergens of ragweed (Amb a 1), minor allergens of mugwort (Art v 6) and major allergens of Cupressaceae family plants Cupressus sempervirens (Cup s 1), Cupressus arizonica (Cup a 1) and Cryptomeria japonica (Cry j 1). Sequence identity between pectate lyases of trees and weeds varies from 44 % (Amb a 1 vs Cup s 1) to 47.7 % (Art v 6 vs Cup a 1). Patients sensitive to pectate lyases of trees may have symptoms during weed pollen seasons due to co-sensitization.

Methods: 70 subjects from Kyiv, Ukraine, including 38 males (54%) and 32 females (46%) with mean age of (18 to 62) years having ACD were included in the study. Patch testing was done using antigens in the basic screening series, a set of the most common haptens recommended by the European Scientific Research Group on Environmental Problems and Contact Dermatitis (EECDRG) for patch testing and differential diagnosis of allergic contact dermatitis.

Result: 6112 or 30.51 % of patients assessed were sensitive to pectate lyases. Sensitivity to Amb a 1 dominated including 5711 patients (28.51 %). 3464 patients (17.29 %) were sensitive to Cry j 1 and 1147 (5.73 %) to Cup a 1. Co-sensitization to all 3 allergens was seen in 851 patients (13.92 %) of the pectate lyase-sensitive group. 2319 (38 %) patients were simultaneously sensitive to Amb a 1 and Cry j 1, and 50 patients (0.82 %) had simultaneous sensitization to Amb a 1 and Cup a 1.

Conclusion: Simultaneous sensitization to pectate lyases of trees and weeds occurs in Ukraine causing symptoms in patients having allergy to Cupressaceae pollen.
ORAL ABSTRACT PRESENTATION

OAS 3: Dec 2, 2023 (13.00-13.45)
WAC23-0080
Basophil activation test based on grass carp extract in the diagnosis of fish allergy

Dr. Christine Yee Yan Wai¹, Miss Pui Fung Li², Miss Chloris Hei Wan Leung², Miss Ann Wing Shan Au², Assistant Professor Agnes Sze Yin Leung³, Professor Ting Fan Leung⁴, Dr. Nicki Yat Hin Leung⁵

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⁴MD, FAAAAI, Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong SAR; Hong Kong Hub of Paediatric Excellence, The Chinese University of Hong Kong, Shatin, Hong Kong SAR
⁵PhD, Department of Paediatrics, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, Hong Kong SAR

Background: With the high homology of parvalbumins, the major fish allergen, allergy to multiple fishes is common. Yet there are also reports of mono-allergy to single fish but tolerating others. These added complexity to the accurate diagnosis of fish allergy. This study thus aimed at investigating the value of basophil activation test (BAT) for fish allergy diagnosis.

Methods: Subjects with history of immediate allergic reactions to fish were recruited in Hong Kong and grouped according to results of double-blind placebo controlled food challenge (DBPCFC) or open challenge against grass carp (GC) and salmon. Serum-specific IgE (sIgE) levels against salmon (f41) and GC (experimental ImmunoCAP developed in collaboration with Thermo Fisher) were measured on Phadia 200. BAT was performed with fresh blood against protein extracts of GC and salmon using the Flow CAST kit.

Result: Forty-seven subjects (median age 4.5 years, 59.6% male) were recruited in this study. Based on food challenge results, 38 subjects were GC allergic and 14/38 subjects were also allergic to salmon. 33 subjects tolerated salmon while none tolerating GC reacted to salmon. Based on area under curve (AUC) values, GC-sIgE and GC-BAT showed similar efficiency for GC allergy diagnosis (AUC=0.78 for both tests). Yet, GC-BAT best discriminated salmon allergy (AUC=0.59) comparing to salmon-sIgE (0.56) and salmon-BAT (0.52).

Conclusion: Grass carp is a more allergenic fish in Hong Kong patients. BAT based on GC extract is a more sensitive biomarker for fish allergy diagnosis. [Funded by the Health and Medical Research Fund (08191356)].
WAC23-0104
Peanut sensitisation revisited: real-world data reveal altered prevalences and patterns of IgE reactivities to peanut-allergens

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Background: Due to complex tertiary and quarternary structures, particular storage proteins exhibit lower analytical sensitivity when produced as recombinant allergens and used in tests for sIgE-detection, in comparison to purified natural allergens. This could potentially lead to bias in reported frequencies of IgE-reactivities when such incompletely folded recombinant allergens are used. Preliminary inhibition tests indicated that this is the case for particular peanut-components.

Methods: The ALEX2-microarray comprises peanut-specific components Ara h 1-3 and 6. Of these, Ara h 1 and 3 are natural allergens. To rule out potential contamination with Ara h 2, nAra h 1-immunoblots were assayed using sera with high levels of peanut-specific IgE. In the present study, we analysed data from 400,000 ALEX2-test results with respect to prevalences and patterns of IgE-sensitisation to the aforementioned peanut-components and compared our results with previously reported data.

Result: Immunoblot-results demonstrated no detectable Ara h 2-contamination of the nAra h 1-preparation used for ALEX2. Among 19,800 samples positive to Ara h 1-3 and/or 6, Ara h 1 (73.9%) showed highest rates of IgE-reactivity compared to Ara h 2 (63.8%), Ara h 3 (44.7%) and 6 (48.7%). Likewise, highest rates of monosensitisations were detected for Ara h 1 (17.3%), followed by Ara h 2 (13.1%), Ara h 6 (6.9%) and Ara h 3 (3.2%).

Conclusion: Our real-world data challenge the notion of Ara h 2 being the most prevalent peanut-allergen. We hypothesise that previous data are skewed due to false negative results obtained with test-systems using recombinant Ara h 1 and 3.
WAC23-0149
Fish allergy: Thermostable allergens in canned fish and challenges in diagnosis and management

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Background: Seafood, including fish, is the most common trigger of food-induced (fatal) anaphylaxis. Fish allergy is highly complex due to an under-investigated species diversity, patient- and species-specific (cross-)reactivity and unknown allergen repertoires as we demonstrated previously. Consequently, its treatment is often limited to strict avoidance of all fish and fish products, which is hampered by a lack of reliable diagnostic and management tools. We sought to evaluate the contradicting, frequent recommendation of consuming canned fish with a comprehensive allergenomic approach.

Methods: Seventeen canned fish products (salmon n=8; tuna n=7; sardine n=2) were assessed for the content of fish proteins and allergens by quantitative mass spectrometry and the integrity of the major allergen parvalbumin (PV) using multiple antibodies. Subsequently, the specific IgE-immunoglobulin (sIgE) binding of five selected products was evaluated for individual fish-allergic patients (n=53). Finally, sIgE-binding proteins were identified by mass spectrometry.

Result: The canned fish showed a markedly reduced PV content and binding to PV-specific antibodies compared to conventionally cooked fish. However, PV and other heat-stable fish allergens, including tropomyosin and collagen, still maintained their sIgE-binding capacity. The canned sardine contained proteins bound by sIgE from 51% of patients, followed by canned salmon (43-45%) and tuna (8-17%). PV was the major allergen in canned salmon and sardine, followed by tropomyosin and collagen.

Conclusion: Canned fish products may not be safe for all fish-allergic individuals. Implementation into the diet should only be considered after detailed evaluation, which may include in vitro diagnostics to various heat-stable fish allergens and food challenge.
WAC23-0182
Long-term follow-up of wheat oral immunotherapy in children with wheat-induced anaphylaxis

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Background: We have previously reported that 3-years of low-dose wheat oral immunotherapy (OIT) at 53 mg induced 41% of children to achieve 400–660 mg short-term unresponsiveness (STU), defined as passing the OFC after the cessation of OIT for 2-weeks. Here, we aimed to evaluate the efficacy and safety of wheat OIT over six-years.

Methods: Twenty-nine patients from our previous study who took 53 mg of wheat protein daily and underwent 400–660 mg OFC yearly after 2-weeks’ cessation of OIT were included. Patients who passed OFC at 3-years continued to receive this amount twice weekly, followed by 1325 and 5200 mg OFC annually. Patients who failed in OFC continued to take 53 mg wheat protein until they achieved 400–660 mg STU, after which they received the same dosage regiment as the first group.

Result: At 4-, 5- and 6-years of follow-up, STU rates at 400–660 and 5200 mg were 41% and 3%; 48% and 10%; and 55% and 10%, respectively. After three years until six years, adverse reaction rates per dosing declined from 2.1% to 0.87%, without anaphylaxis. Wheat and omega-5 gliadin sIgE significantly reduced from 75 to 36 and 2.3 to 0.7 kUA/L at the point of years 3 and 6, respectively (P < 0.001).

Conclusion: In children with wheat-induced anaphylaxis, fixed low-dose OIT and its follow-up for the 6 years could safely induce more than half of children to 400–600 mg STU and some to 5200 mg STU with significant immunological changes.
WAC23-0292
Usefulness of Egg white OFC in patients with egg yolk FPIES sensitized to egg whites

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Background: Most patients with food protein-induced enterocolitis syndrome (FPIES) due to hen’s eggs react to egg yolk, not egg whites. However, egg yolk FPIES patients sensitized to egg whites are generally instructed to avoid hen’s eggs completely. Therefore, we performed the oral food challenge (OFC) separately for egg yolk and egg white for patients with egg yolk FPIES sensitized to egg whites to determine whether they could ingest egg white.

Methods: This study included patients with egg yolk FPIES diagnosed by international consensus guidelines having egg white-specific immunoglobulin (Ig) E (sIgE) levels ≥0.35 kUA/L and/or ≥3 mm-sized wheals in the skin-prick test (SPT) for egg white. The egg white OFC was first performed using egg white powder (<0.5 mg of egg yolk protein contamination by enzymatic method) equivalent to 2 g of boiled egg whites, followed by powder equivalent to 10 g of boiled egg whites.

Result: This study included 23 patients with a median age of 16 months during the egg white OFC. The median egg whitesIgE and ovomucoid-sIgE levels at the first visit were 4.3 kUA/L and <0.1 kUA/L, respectively, and the median diameter of the wheals in the SPT for egg white was 10 mm. According to the results, 7 (30%) patients were positive for the egg white OFC (for 2 g or 10 g), 3 (13%) had skin and/or respiratory symptoms, and 4 (17%) vomited after more than 2 hours without skin or respiratory symptoms, of which 2 children experienced lethargy. No patients received intramuscular adrenaline. The ovomucoid-sIgE levels at the first visit were significantly higher in the egg white OFC-positive patients than in the egg white OFC-negative patients (2.7 kUA/L vs. <0.1 kUA/L; p = 0.032).

Conclusion: Performing the egg white OFC for patients with egg yolk FPIES sensitized to egg whites would help to clarify whether they can consume egg whites instead of avoiding eggs completely.
ORAL ABSTRACT PRESENTATION

OAS 4: Dec 3, 2023 (12.00-12.45)
The influence of maternal allergy or atopy on child wheezing and lung function at two years in a South African birth cohort study

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Background: Knowledge on early life determinants of respiratory disease in children is important for directing interventions to strengthen lung health.

Methods: Mother and child pairs enrolled in a South African birth cohort study were followed for 2 years for wheezing episodes and lung function measurements. A subset of mothers had data on self-reported allergies and blood tests (total IgE, phadiatop and ascaris IgE). Maternal and child characteristics were described. Correlations were explored between maternal allergy and atopy with children’s wheeze characteristics and lung function tests conducted at 6 weeks and annually.

Result: Median maternal age was 25 years with 33% smokers and 18% living with HIV. Infants were mostly term (85%), male (53%) with a median birth weight of 3kgs and one HIV infected infant (0.2%). 38% of children had ever wheezed at 2 years, 15% had recurrent wheeze. Wheezing frequency was influenced by maternal asthma (OR 2.13, 95%CI:1.18,3.82; p<0.01), smoking (OR 1.3, 95%CI:1.03,1.64; p<0.001), male sex (1.61; 95% CI: 1.31,1.98; p<0.001), autumn birth (153; 95%CI:1.15, 2.03; p<0.001) and a previous lower respiratory tract infection (LRTI) (3.87, 95%CI:3.09,4.86; p<0.001). Risk factors for recurrent wheezing included maternal asthma (4.36; 95%CI: 2.03,12.49; p<0.001) and LRTI (2.12; 95%CI:0.44, 10.07; p<0.05). Children whose mothers had self-reported hay-fever had a higher FeNO (2.05, 95% CI 0.03, 4.13, p = 0.05). Ascaris sensitization had no effect on wheeze or lung function.

Conclusion: Maternal allergy and atopy influence childhood wheezing and impact healthy lung growth.
WAC23-0161
IL-33 regulates tissue remodeling via MAPK and NF-kB signal pathways in chronic rhinosinusitis

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Background: IL-33 has been implicated in upper airway inflammatory diseases. This study aims to investigate effects of IL-33 on tissue remodelling and to determine underlying molecular mechanisms.

Methods: Sinonasal tissues were obtained from healthy, CRSsNP, and CRSwNP. Sinonasal fibroblasts were isolated and cultured. Expression levels of α-SMA, fibronectin, ST2, phosphorylated MAP kinases (p38, ERK, and JNK), and activation of NF-κB were determined. Migration of fibroblast was measured by trans-well migration assay and wound scratch assay. Contractile activity was measured by a collagen gel contraction assay. siRNA for ST2 was transfected to down-regulate ST2 expression.

Result: IL-33 and ST2 expression levels were upregulated in CRSwNP mucosa, compared with healthy control and CRSsNP. IL-33 mRNA expression positively correlated with expression of α-SMA, fibronectin, and collagen type 1. IL-33 significantly increased levels of α-SMA, fibronectin, and collagen gel contraction. These mRNA and protein levels were dose-dependently increased significantly by IL-33 in fibroblasts. Migration and collagen gel contraction was also increased by IL-33 treatment. Inhibition of ST2 by siRNA treatment significantly decreased expression level of ST2, α-SMA, and fibronectin stimulated by IL-33 treatment. Stimulatory molecular mechanism of IL-33 was involved in ERK, p38, JNK phosphorylation, and NF-κB activation. Their specific inhibitors blocked myofibroblast differentiation and extracellular matrix production in fibroblasts and ex vivo organ culture of inferior turbinate.

Conclusion: IL-33-stimulated myofibroblast differentiation and extracellular matrix production through ST2/MAPK/NF-κB signaling pathway which may play an important role in CRSwNP development.
WAC23-0235

Internalizing behavior problems in early life are preceding risk factors of childhood asthma via DNA methylation: The COCOA study

Assistant Professor Jisun Yoon¹, Assistant Professor Jisun Yoo¹, Miss Seung-Hwa Lee², Associate Professor So-Yeon Lee³, Dr. Da kyeong Lee³, Dr. Eun Young Baek³, Professor Soo-Jong Hong³, Dr. Sungsu Jung⁴ Professor Kangmo Ahn⁵, Associate Professor Dong In Suh⁶, Dr. Youn Ho Shin⁷, Professor Kyung Won Kim⁸, Mrs. Jiseon Kim⁹, Dr. Hea Young Oh⁹, Professor Yee-Jin Shin¹⁰

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Background: The link between children's behavior problems and asthma is suggested in previous studies, but causality remains debated. This study aimed to investigate whether early-life behavior problems cause subsequent childhood asthma in a prospective birth cohort.

Methods: This study included 1,041 children aged 6-10 years from the Cohort for Childhood Origin of Asthma and allergic diseases (COCOA) study. Asthma diagnosis was defined by physicians. The Korean version of the Child Behavior Checklist (CBCL) assessed internalizing problems from ages 2-6 years. Latent generalized mixture modeling identified distinct growth trajectory classes based on prospective CBCL scores. DNA methylation profiling used the Infinium Human Methylation EPIC BeadChip on DNA at age 7 years.

Result: Increased anxious/depressed score in CBCL at 2 years old significantly increased the risk of asthma. Elevated somatization score in CBCL at 4 and 6 years old significantly increased the risk of asthma at each age. Consistent high scoring of internalizing behavior problems (internalization, anxiety/depression, and
somatization) between 2 to 6 years old showed a significant association with childhood asthma. DNA methylation analysis revealed significant differences in the methylation profile of asthma with high behavior problems compared to healthy controls with low behavior problems. Notably, hypo-methylation of the histidine ammonia-lyase (HAL) gene correlated negatively with behavior problem scores.

**Conclusion:** Early-life internalizing behavior problems precede the development of childhood asthma in the birth cohort study, via hypomethylation of HAL gene. Funding: Korea National Institute of Health (2014-E51004-02, 2017-E67002-00, 2017-E67002-01, 2017-E67002-02, 2020E670200), National Research Foundation of Korea (NRF-2022R1F1A1076250).
Dupilumab improves nasal obstruction in patients with chronic rhinosinusitis with nasal polyps, irrespective of gender

WAC23-0290

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Background: Dupilumab has demonstrated efficacy in patients with severe chronic rhinosinusitis with nasal polyps (CRSwNP) and was generally well tolerated. The efficacy of dupilumab by gender has not been reported.

Methods: Objective: To assess baseline characteristics and dupilumab efficacy by gender in patients with severe CRSwNP from the SINUS-52 study (NCT02898454). Methods: This post-hoc analysis included all patients randomized to placebo or dupilumab 300 mg every 2 weeks. Efficacy was assessed using nasal polyp score (NPS; range 0–8) and nasal congestion score (NC; 0–3).

Result: Of 303 patients, 192 (63%) were male and 111 (37%) were female. Baseline disease characteristics were generally similar in male and female patients except that coexisting asthma (78% vs 46%) and non-steroidal anti-inflammatory drug exacerbated respiratory disease (39% vs 19%) were more frequent in females than males. Baseline NPS and NC scores were similar between male and female patients. Least squares mean differences [95% confidence interval] in change from baseline at Week 52 were: NPS −2.33 [−2.80, −1.86] in male and −2.54 [−3.18, −1.90] in female patients (both P <0.0001); NC −0.87 [−1.10, −0.64] in male and −1.19 [−1.50, −0.88] in female patients (both P <0.0001). Significant improvements in NPS and NC were observed from the first assessment at Week 4 in both male and female patients (all P <0.0001 except NC for female patients, where P <0.01). The safety of dupilumab was consistent with its known safety profile.

Conclusion: Dupilumab treatment was associated with significant improvements in NPS and NC irrespective of gender.
WAC23-0334
Treating allergic rhinitis before allergen exposure for better clinical outcomes

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Background: Pre-treatment with H1-antihistamines may prevent or reduce allergic rhinitis (AR) symptoms if taken before identified allergen exposure or start of the allergy season. Previous clinical studies suggest pre-treatment with fexofenadine hydrochloride — a non-sedating antihistamine — may provide additional relief of AR symptoms. This study aimed to assess its efficacy as pre-treatment in patients with seasonal AR.

Methods: This phase 3b, double-blind, randomised, placebo-controlled study was conducted in an Environmental Exposure Unit. Participants received 180 mg fexofenadine or placebo for two days prior to 3-hour ragweed pollen exposure (3000±500 grains/m3). All fexofenadine and placebo recipients received 180 mg fexofenadine after pollen exposure started. Primary endpoint was area-under-the-curve (AUC) of Total Nasal Symptom Score (TNSS: sum of rhinorrhoea, sneezing and nasal itching), from 0–6 hours. Total Ocular Symptom Score (TOSS: sum of red/burning eyes, tearing, itchy/watery eyes) was a secondary endpoint. Safety was assessed.

Result: 94 participants receiving fexofenadine (47) or placebo (47) during the pre-treatment period were included in the primary analysis. Mean age was 45.8 (±12.86) years and 30 (±14.17) years the duration of AR, 72% were female. TNSS AUC (0–6 hours) showed significant reduction with fexofenadine by 20% (incremental relief) when administrated before (pretreatment period: p=0.038 vs placebo) and during pollen exposure and maintained for 12-hour (observation period). The TOSS improved by 29% (incremental relief) at H6 (p=0.025 vs placebo), increasing to 34% at H12 (p=0.011 vs placebo). No serious AEs were reported.

Conclusion: Fexofenadine provides significant additional AR symptoms relief versus placebo when administrated before pollen exposure and was well-tolerated.
POSTER PRESENTATION

PDS1: Dec 1, 2023
(10.00-10.30)
WAC23-0016
Relationships Between Computed Tomographic Values and Lung Function Using AI technology Based on Deep Learning in Asthmatic Patients

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Background: With the introduction of artificial intelligence technology, machines can analyze computed tomography (CT) values by themselves, but studies that have introduced these technologies to asthma patients are very rare. Therefore, we attempted to explore indicators related to lung function and inflammatory markers in asthma patients through quantitative CT analysis.

Methods: From 151 asthma patients, 200 images of CT were acquired and quantified using deep learning technology. For each level of branch of airway, the wall area per perimeter of each airway lumen and that of selected branch was measured. The relationship between the wall area and clinical values was analyzed.

Result: The duration of asthma and symptoms were correlated with the wall area of the main bronchus and lobar bronchus. While FENO and specific IgE to house dust mite were mainly correlated with small airway wall area. In the case of lung functions, FVC, FEV1 and FEV1/FVC were correlated with the wall area of most level of branches, but a significant correlation was shown at 20-25mm and 25-30mm branches.

Conclusion: Duration of asthma was related to the large airway wall area, and the degree of allergic inflammation was related to the small airway wall area. It was confirmed that CT measurements obtained from images through deep-learning AI technology could reflect the FVC, FEV1, FEV1/FVC, FENO, and specific IgE to house dust mite. In the future, we can imagine not only the current state but also the prognosis of the patient’s disease beyond the level of simple images through AI analysis of CT.
WAC23-0053
Anti-Aminoacyl-tRNA Synthetase-Interacting Multifunctional Protein-1 Antibody Improves Airway Inflammation in HDM Induced Asthma Mice.

Professor Jae-Hyun Lee¹, Dr. Hye Jung Park², Dr. Sung-Ryeol Kim³, Dr. Kyung Hee Park⁴, Dr. Jung-Won Park⁴, Professor Jae-Hyun Lee⁴

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Background: Various biologics have been developed and used to treat severe asthma; however, commercialized biologics have limitations in T2-low asthma. This is because its main target is the T2 inflammation marker. Therefore, there is an unmet need for treatment of T2-low severe asthma. Aminoacyl-tRNA synthetase (ARS)-interacting multifunctional protein 1 (AIMP1) is an auxiliary protein in the mammalian multiaminoacyl tRNA synthetase (MARS) complex. AIMP1 also acts as a cytokine and induces the secretion of proinflammatory cytokines. Since anti-AIMP1 reduced IL-6, TNF-α, and IL-17A levels in a mouse model, it could be effective in T2-low asthma.

Methods: Wild-type BALB/c mice were sensitized and challenged by intranasal inoculation with crude HDM extract. Atliximab, a chimeric AIMP1 antibody, was administered once on Day 14. We evaluated airway hyper-responsiveness (AHR), performed cellular analyses of bronchoalveolar lavage (BAL) fluid, measured inflammatory cytokine levels, and examined histological features.

Result: Atliximab suppressed AIMP1 expression in asthmatic mice in a dose-dependent manner. The treatment of asthmatic mice with atliximab resulted in a reduction of airway hyper-responsiveness (AHR) and inflammatory cell counts, such as neutrophils and eosinophils, in the bronchoalveolar lavage (BAL) fluid. The levels of interleukin (IL)-6, IL-13, and TGF-β in the lung tissue were decreased in mice treated with high-dose atliximab. Moreover, atliximab reduced the goblet cell hyperplasia and peribronchial fibrosis.

Conclusion: Atliximab improved not only neutrophilic inflammation, but also eosinophilic inflammation. These data suggest that anti-AIMP1 plays an important role in the treatment of severe asthma.
WAC23-0054
Serum neuropilin-1 levels might predict airway remodeling by aging and smoking in asthma

Professor Tae Bum Kim¹, Dr. Ji-Yoon Oh¹

¹Allergy, Asan Medical Center

Background: Bronchial asthma is characterized by reversible airway obstruction and remodeling caused by chronic allergic inflammation. Airway remodeling is promoted by the production of vascular endothelial growth factor (VEGF) during epithelial damage and healing due to viral infection or inflammation. It is also known to be mediated by neuropilin-1 (NRP-1).

Methods: We analyzed 421 asthma patients who visited our Allergy and Asthma Center. NRP-1 was measured in the blood of a total of 421 asthma patients. And the baseline characteristics according to their NRP-1 expression were analyzed.

Result: As a result, the NPR-1 was significantly higher in the group under 65 than in the group over 65 (1628.36±589.51 vs 1416.75±671.42, p<0.001). Regarding smoking history, current smokers and ex-smokers had significantly higher NRP-1 than never smokers (1647.16±572.34 vs 1528.5±579.37, p=0.041). When the ICS dose was compared, the medium and high ICS users had higher NRP-1 than low ICS users (1589.87±591.7 vs 1436.12±419.21, p=0.049). The NRP-1 was significantly higher in the group with an FVC 70% or higher than in the group with an FVC of 70% or lower. There was no significant difference in NRP-1 according to sex, BMI, blood IgE, blood eosinophil count, FeNO, ACT score and underlying disease.

Conclusion: Serum neuropilin-1 levels might predict airway remodeling by aging and smoking in asthma.
WAC23-0063
Effect of gender on differences in airway hyperresponsiveness between T2-high and T2-low asthma endotypes

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Background: Although several studies have shown potential gender specific differences in the pathophysiology and clinical presentation of asthma, effect of gender on differences in airway hyperresponsiveness (AHR) between T2-high and T2-low asthma endotypes remains to be fully elucidated.

Methods: The subjects comprised 369 steroid-naïve Japanese adults [139 men and 230 women] with asthma. T2-high inflammation was defined when at least one of the following conditions occurred: peripheral blood eosinophil counts ≥ 300 cells/μL, fractional exhaled nitric oxide levels ≥ 30 ppb, or positive IgE sensitization to aeroallergens; T2-low inflammation was defined by the absence of all these conditions. AHR was measured using a continuous methacholine inhalation method (Astograph). We used values of the cumulative dose of inhaled methacholine measured at the inflection point at which respiratory conductance starts to decrease (Dmin) as an index of AHR. We retrospectively compared the values of Dmin between T2-high and T2-low asthmatic patients separately for men and women.

Result: In 139 men, there was no significant difference in the values of Dmin between T2-high 113 patients and T2-low 26 patients (2.68±2.92 and 3.48±3.69 U, respectively; P=0.23); in 230 women, T2-high 151 patients compared with T2-low 79 patients had significantly lower Dmin values (2.87±2.78 versus 3.76±3.27 U, respectively; P=0.03).

Conclusion: Our results suggest that T2-high asthma endotype is more associated with increased AHR than T2-low asthma endotype in women but not in men.
WAC23-0155
Severe Asthma Network Italy definition of Clinical Remission in Severe Asthma: a Delphi consensus

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Background: The main goal in Severe Asthma (SA) management is to reach clinical control and to erase the future risk of exacerbations and oral corticosteroids (OCS) use. Various definitions are currently used to identify clinical, inflammatory and complete remission. The aim of the study is to reach an independent and valuable SA Remission definition through a Delphi Consensus.

Methods: Round 1 (R1) and 2 (R2) questionnaires were submitted to a panel of 80 experts selected from the Severe Asthma Network Italy (SANI). Agreement was measured on: 1.General questions about remission; 2.Clinical remission criteria; 3.Complete or partial clinical remission and its duration; 4.Cut-off values of asthma control, lung function and inflammation. A high consensus was defined from grade 4 on a 5-points Likert scale and reached for at least 2/3 of the experts (66.6%).

Result: Consensus was reached for 18 statements out of 24 in R2. The panelists confirmed the definition of clinical remission as a composite set of several criteria. Clinical Remission was defined by no need for OCS and all of the three (Complete) or 2 out of 3 (Partial) of the following criteria: absence of symptoms, absence of exacerbations, and pulmonary function stability. Agreement was reached for duration of 1 year, ACT score between 20-25/25 and ACQ less than 1.5.

Conclusion: The definitions of Partial and Complete Clinical Remission by SANI Delphi Analysis are valuable, independent, and easy to use tools to grade the efficacy of different treatments in SA patients.
Pre-existing allergic diseases as risk factors for Long-COVID symptoms: a systematic review of prospective cohort studies

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Background: The role of allergy as a risk factor for Long-COVID (LC) is unclear. We aimed to systematically review and appraise the epidemiological evidence on allergic diseases as a risk factor for LC (PROSPERO: CRD42023391245).

Methods: We systematically searched the literature for prospective cohort studies on with a follow-up duration of at least 12 months for LC symptoms, published between January 2020 and January 2023 that recruited individuals with a confirmed SARS-CoV-2 infection and information on pre-existing allergic diseases. Risk of bias and certainty of evidence were assessed (GRADE), data were extracted. Random effects meta-analyses were used to pool unadjusted odds ratios (ORs) within homogeneous data subsets.

Result: The identified 13 studies (sample sizes: 39-1,950, 18-66% female, mean age 38-65 years, LC frequency: 11-90%) were all associated with a high risk of bias. Four of these studies did not provide sufficient data to calculate ORs. Significant associations were observed between increased LC incidences and pre-existing asthma measured in hospital-based populations (n = 6; OR = 1.94; 95% CI: 1.08, 3.50) and pre-existing rhinitis (n = 3; OR = 1.96; 95% CI: 1.61, 2.39), respectively. However, the level of certainty regarding these exposure-outcome associations was very low.

Conclusion: Findings show that asthma and allergic rhinitis may increase the risk of LC, although the certainty of this evidence is tenuous.
Lactobacillus paracasei-derived extracellular vesicles alleviate neutrophilic asthma by inhibiting the JNK pathway in airway epithelium

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Background: Lactobacillus paracasei has been known to reduce airway resistance and inflammation in asthma. However, the therapeutic effect of its extracellular vesicles (EVs) in patients with asthma remains unclear.

Methods: Composition of gut microbial EVs was compared by metagenomic analysis in the mouse model of asthma. The components of proteins and metabolites in L. paracasei-derived EVs (LpEV), including proteins and metabolites, were identified by peptide mass fingerprinting and metabolomic analysis. The serum levels of specific IgG1 or IgG4 antibodies to LpEV were compared by ELISA between patients with eosinophilic asthma (EA, n = 10) and those with neutrophilic asthma (NA, n = 10) as well as with healthy controls (HCs, n = 10). Finally, therapeutic effects of LpEV and its metabolites in subjects with asthma were validated in vivo or in vitro.

Result: A significantly lower proportion of EVs derived from Lactobacillus at the genus level was noted in mice with NA than in control mice. Moreover, lower serum levels of LpEV-specific IgG4, but not IgG1, were shown in patients with NA than those in EA or HCs with a positive correlation between levels of LpEV-specific IgG4 and FEV1(%). In addition, oral administration of LpEV significantly reduced airway resistance and inflammation in mice with NA; LpEV and their 3 metabolites (dodecanoic acid, palmitoleic acid, and D(-)-tagatose) significantly inhibited JNK phosphorylation and IL-8 production in airway epithelium in vitro.

Conclusion: These findings suggest that LpEV may have a therapeutic potential targeting NA by suppressing the JNK pathway and proinflammatory cytokine production in airway epithelium.
WAC23-0056
Lithuanian women’s sensitization to inhalant allergens, according to molecular allergy diagnostics: age related differences

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Background: There is a lack of epidemiological studies on the prevalence of sensitization to inhalant allergens for women of different age groups obtained by molecular diagnostic methods. The aim of our study was to determine the prevalence of common inhalant allergens and molecular profile of lithuanian women and to analyze it’s age differences.

Methods: A retrospective descriptive analysis of data from 337 women was performed. The sample was divided into groups by age (group 1 - girls under 18 y/o (40,95%), group 2 - women of child-bearing age, 18-44 y/o (45,40%), group 3 - women over 44 y/o (13,65%)). Molecular alergologic testing was performed with ALEX2 macroassay– a diagnostic tool containing 117 whole extracts and 178 recombinant allergens. Statistical analysis was performed using IBM SPSS Statistics 28.0.

Result: 58,46% of women were sensitized to at least one inhalant allergen: group_1 – 62,32%, group_2 – 56,21%, group_3 – 54,38%. Sensitization to pets (35,0%) and dust mites (33,5%) was diagnosed the most frequently. Group_1 was mostly sensitized to dust mites, group_2 and group_3 –to pets. Group_1 was significantly more frequently sensitized to tree pollen, dust mites, pets and animals than group_2. Group_3 was sensitized significantly less frequently to grass pollen and animals than group_2.

Conclusion: Our study determined that sensitization to inhalant allergens is different for women of different age groups: the younger the women were, the higher frequency of sensitization they had. These results may be influenced by environmental factors as well as the influence of sex hormones. Further studies are needed to confirm the results of our study.
Risk of New-onset Asthma in adults after COVID-19 Infection

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**Background:** While some respiratory virus infections are one of the causes of new-onset asthma, it remains uncertain whether coronavirus disease 2019 (COVID-19) is linked to an elevated risk of such cases. We conducted an investigation to ascertain whether recent COVID-19 infections contribute to a heightened risk of developing new-onset asthma and also explored the potential of COVID-19 vaccination in mitigating this risk.

**Methods:** Employing a retrospective cohort design, we utilized data from the Korean National Health Insurance claim-based database. Three study groups were constructed, along with their propensity score (PS)-matched counterparts: Study 1: Encompassing participants diagnosed with COVID-19 (COVID-19 cohort) and their PS-matched controls. Study 2: Encompassing participants who had received COVID-19 vaccination (vaccination cohort) and their PS-matched controls. Study 3: Focusing on the vaccination cohort and their PS-matched controls, without participants diagnosed with COVID-19.

**Result:** Within Study 1, we observed that 1.6% of individuals in the COVID-19 cohort (690 out of 44,203) and 0.7% of the matched cohort (325 out of 44,203) developed new-onset asthma with incidence rates of 31.28 and 14.55 per 1,000 person-years (p < 0.001). Participants in the COVID-19 cohort exhibited a notably higher risk of experiencing new-onset asthma (adjusted hazard ratio [aHR]: 2.14; 95% confidence interval [CI]: 1.88–2.45) compared to their PS-matched counterparts. In Study 2, individuals within the vaccination cohort demonstrated a reduced risk of new-onset asthma when compared to their PS-matched controls (aHR: 0.82; 95% CI: 0.76–0.89). However, among those without a COVID-19 diagnosis, COVID-19 vaccination did not exhibit an association with lowered risk of new-onset asthma in Study 3 (aHR: 0.95; 95% CI: 0.87-1.04).

**Conclusion:** Our findings suggest an association between COVID-19 and an increased incidence of new-onset asthma, which can be mitigated through COVID-19 vaccination.
WAC23-0259
Real-world effectiveness of omalizumab in patients with severe asthma

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Background: Omalizumab is a commonly prescribed add-on therapy for reducing asthma exacerbation (AE) in asthmatics, but there has been no reliable biomarker for predicting response or treatment duration. The present study aims to evaluate the real-world effectiveness of omalizumab in severe adult asthmatics with monitoring laboratory parameters.

Methods: This is an observational study with analyzing the electronic health record of Ajou University Medical Center from 1996 to 2022. The omalizumab group consisted of 151 asthmatics who had received additional omalizumab on ICS plus LABA. The control group was defined as 151 asthmatics (having previous histories of AE) had maintained ICS plus LABA without any biologic treatment. The Cox proportional hazard regression model was applied to calculate the cumulative incidence of AE and asthma-related hospitalization at 6, 12, and 24 months.

Result: The omalizumab group showed significantly lower rates of AE and asthma-related hospitalization at all-time points than the control group. Greater reduction rate in oral corticosteroid (OCS) doses (>50%) was noted in the omalizumab group than in the control group. Blood neutrophil counts were significantly lower in the omalizumab group with achieving OCS reduction than in that without.

Conclusion: These findings provide real-world evidence that omalizumab treatment (at least 6 months) could effectively reduce AE, hospitalization, and OCS use in patients with severe asthma, where increased blood neutrophil counts may be a marker for unfavorable responses.
WAC23-0283
Assessment of the Relationship between induced sputum Eosinophil Count and Absolute Eosinophil Count as Indicators of the Severity of Bronchial Asthma

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Background: Asthma stands as a prevalent significant non-communicable disease, profoundly affecting the quality of life for numerous individuals. On a global scale, asthma holds the 16th position among the primary contributors to years lived with disability and ranks 28th among the leading factors contributing to the overall burden of disease, as assessed through disability adjusted life years. This study aimed to establish a correlation between sputum and absolute eosinophil counts with asthma severity, FEV1, and other factors related to asthma.

Methods: Evaluation of Asthma Severity: The degree of asthma severity was evaluated following the guidelines set forth by GINA. This encompassed the following aspects:
- Asthma Control Questionnaire: This questionnaire encompassed the frequency of both daytime and nighttime symptoms, the frequency of using short-acting beta-agonists, and the extent to which daily activities were disrupted over the past 4 weeks.

Result: Higher AEC levels are associated with lower FEV1 values. For a sputum eosinophil count of less than 3%, there was no statistically significant relationship between the count and FEV1. However, when the count was between 3% and 5%, there was some correlation, but it was not statistically significant. For a sputum eosinophil count greater than 5%, there was a statistically significant relationship between the count and FEV1.

Conclusion: Evaluating eosinophil levels in sputum and blood represents a straightforward and economical approach that directly quantifies airway inflammation. Consequently, this method holds the potential to pinpoint distinct phenotypes within asthmatic individuals who may exhibit heightened steroid responsiveness.
A Retrospective, Observational, Multicentre Study Evaluating Asthma Control in patients on ‘Fluticasone propionate/Salmeterol Proactive Regular Dosing with a history of uncontrolled asthma

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Background: Asthma is a chronic condition characterized by airway inflammation and hypersensitivity. Proactive regular dosing (PRD) and ICS/Formoterol or ICS with SABA as-needed approach (PRN) are two different treatment modalities in the asthma. There is lack of data evaluating treatment switch from uncontrolled asthma patients on PRN regime to Fluticasone propionate/Salmeterol (FP/SAL) PRD.

Methods: This real world retrospective observational study aimed to evaluate the asthma control in patients who were on ICS/Formoterol or ICS/SABA PRN with uncontrolled asthma that were switched to FP/SAL PRD. The primary endpoint included percentage of patients with improved Asthma Control Test (ACT) score of ≥ 20 or ACT score ≥3 points improvement at follow-up visit. Secondary endpoints included moderate to severe exacerbation rate and adverse drug reactions (ADRs). Database of uncontrolled asthma patients on ICS/Formoterol PRN or ICS with SABA PRN (10
centres, total n=120 patients, ≥ 18 years old) switched to FP/SAL PRD were selected and standard statistical methods were used.

**Result:** From a total of 120 uncontrolled patients, 76 (63.3%) were on Bud/Form PRN and 44 (36%) patients were on ICS with SABA PRN (mean age was 50.8 years ± 14.5 years, 35 males, 85 females). Overall, 110 (91.1%) subjects who switched to FP/SAL PRD achieved asthma control, p<0.001. Moderate and severe asthma exacerbation reduction rate was 51.2% and 57.3% respectively (not statistically powered). No ADR was reported.

**Conclusion:** This is the first study to highlight the effectiveness of FP/SAL PRD in uncontrolled asthma patients with ICS/Formoterol or ICS with SABA PRN. Further clinical studies are required to validate these findings.
WAC23-0342
Linking sputum microbial patterns as a marker of clinical asthma characteristics

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Background: The role of the microbiome in asthma pathogenesis is increasingly recognized. However, the key microbiota and microbial patterns associated with asthma remains elusive.

Methods: 16S rRNA sequencing data was obtained from induced sputum samples collected from 284 participants, including healthy control (n = 55) and asthmatics (n = 229). The Kruskal-Wallis test was employed to identify bacterial genera associated with asthma. The Partitioning Around Medoids (PAM) clustering method was used to categorize the asthma airway microbiome.

Result: The presence of asthma significantly altered alpha diversity (P = 0.005) and beta-diversity indices (P = 0.043) of the airway microbiome. Compared to the healthy control group, asthma patients exhibited significantly reduced abundance of Selenomonas, Peptostreptococcus genera. To validate the robustness of microbial patterns, asthma patients were clustered into two groups (C1 and C2) based on the microbial abundance. The two groups differed in both alpha diversity (P = 1.256x10^-10) and beta-diversity (P = 0.001). C2, characterized by decreased abundance of Streptococcus, Prevotella, Veillonella, Campylobacter, and Selenomonas, along with increased levels of Haemophilus and Pseudomonas, exhibited poorer asthma control, with a higher mean ACQ score compared to C1 (12.160 vs. 9.226, P = 0.034) and a higher logtransformed blood eosinophil count (2.345 vs. 1.891, P = 0.013).

Conclusion: This study suggests asthma may have a significant impact on the diversity and composition of the airway microbiome. It identifies specific microbial patterns associated with asthma and demonstrates that these patterns are linked to the asthma control. The findings highlight the importance of airway microbiome in understanding asthma.
**WAC23-0351**
**Correction of metabolic acidosis in patients with asthma.**

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**Background:** Correction of metabolic acidosis with 4.2% sodium bicarbonate in patients with moderate asthma may be beneficial.

**Methods:** Cases from the authors' clinical practice were assessed along with analytical study of the literature.

**Result:** The effectiveness of the treatment was assessed based on frequency of daytime and nighttime attacks, SABA usage, and peak flow. On the 12th day of treatment, patients of Group 2 were shown to have improved FVC moved up to (86.7±3.2) %, FEV1 – (77.3±2.91) %, and PEF – (83.2±2.03) % with blood gas indicators normalized including pCO2, pO2, and HCO3 increasing blood pH. In the treatment of metabolic acidosis, normalization of acid level of the blood improves bronchial obstruction.

**Conclusion:** Infusion buffering pH using 4.2% sodium bicarbonate has a positive impact on the indicators of acid-base status and respiratory function in patients with uncontrolled asthma.
WAC23-0097
Comparison of Two MAST Assays; LG AdvanSure AlloScreen Max 108 and Minaris Optigen Allergy System

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Background: The AdvanSure AlloScreen Max 108 assay is a recently introduced multiple allergen simultaneous test (MAST) for specific IgE (sIgE) against 108 allergens. We compared the performances of AdvanSure AlloScreen Max 108 and Minaris Optigen compared to ImmunoCAP allergen-specific IgE assay.

Methods: The total of 64 serum samples, tested by MAST Optigen allergy system (Minaris Medical Co., Ltd., Tokyo, Japan) (34 by inhalant panels and 30 by food panel) in the clinical laboratory of Seoul National University Hospital were tested by AdvanSure AlloScreen Max 108 (LG Life Science, Seoul, Korea). The discrepant results between the two assays were retested with ImmunoCAP allergen-specific IgE assay in 134 available sera (Thermo Fischer Scientific, Uppsala, Sweden).

Result: The total agreement of qualitative results between the two assays was 74.1%. The total agreement of semiquantitative results (+/- 2 class) was 84.6%. The agreement was excellent for cat allergen (98.4%), dog (93.8%), and penicillium (100.0%) and poor for birch (62.5%), cedar (29.4%), acacia (58.8%), and peanut (66.7%). Among the 134 discrepant cases tested by ImmunoCAP allergen-specific IgE assay, 48 cases showed the bromelin (indicating cross-reactive carbohydrate determinants) positivities. Among the 86 bromelin-negative cases tested by ImmunoCAP assay, AdvanSure AlloScreen Max 108 (47/86 = 54.7%) showed slightly higher concordant rate with ImmunoCAP (47/86 = 54.7%) than Optigen allergy (39/86 = 45.3%) but didn’t reach a statistical significance.

Conclusion: The AdvanSure AlloScreen Max 108 assay showed good agreement with Optigen allergy. AdvanSure AlloScreen Max 108 seems to be a suitable MAST for the screening of allergic diseases.
WAC23-0102
Multiple allergen simultaneous test is not proper for the screening of red meat allergy

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Background: Red meat allergy presented as delayed anaphylaxis or urticaria due to α-gal allergy and caused by several red meat such as beef and pork. Multiple allergen simultaneous test (MAST) has been used as a screening test for food-specific IgE. This study evaluated the detection rates of MAST and ImmunoCAP for specific IgE for pork and beef.

Methods: We retrospectively review the patients with red meat allergy in a referral hospital, who diagnosed by an allergist with unequivocal clinical history and positive results in specific IgE for α-gal using ImmunoCAP. The clinical manifestation of red meat allergy and results of MAST and ImmunoCAP were reviewed. The results of MAST and ImmunoCAP were divided into classes 0-6 according to the concentration range and class 0 (< 0.35 IU/mL in MAST and < 0.35 kU/L in ImmunoCAP, respectively) was considered negative.

Result: The medical records of 28 patients were retrospectively reviewed. For ImmunoCAP, 85.7% (24/28) showed positive results for pork-specific IgE and 96.4% (27/28) for beef-specific IgE. The titer of serum specific IgE for α-gal, pork, or beef were not different according to the history of anaphylaxis. On the other hand, MAST was performed only in 9 patients and none of them showed positive results in specific IgE for pork or beef.

Conclusion: This study shows that the sensitization to beef and pork is not demonstrable in MAST for the patients with red meat allergy. Thus, specific IgE for α-gal should be used to screen for red meat allergy.
WAC23-0103
Molecular allergy

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Background: the new tool ALEX2-macroarray (DASIT), a multiplex automated allergy test, evaluates 300 allergens using minimal serum/plasma volumes. It might be of help in the first assessment of complex clinical cases. We present a case of a 23-years man with a complex anaphylaxis managed in our hospital.

Case study: The patient admitted to our multidisciplinary department for allergy re-examination following recent onset of anaphylaxis, dysphagia and food bolus episodes not clearly associated with a specific trigger. Clinical history: atopic dermatitis with sensitization to albumen proteins; allergic rhinitis with sensitization to primary proteins of dust mites, grasses, cypress, olive, dog, cat, parietaria; eosinophilic bronchial asthma and two previous episodes of severe anaphylaxis after ingestion of nuts, cuttlefish, shrimps, molluscs. Clinical test and analyses: ALEX2 macroarray (DASIT); spirometry; FeNo for determination of lung inflammation degree; EGDS with biopsies for dysphagia assessment. Lung-functions tests were normal. EGDS showed a marked eosinophilic infiltrate (120 Eosinophils/hpf; n.v.<15/hpf) with granulocytic abscesses which confirmed the hypothesis of eosinophilic esophagitis. ALEX2 confirmed the positivity for both S-albumins for nuts, and the fish tropomyosin, but not the previously recorded high sensitization to egg white, which was reintroduced in the patient diet. New sensitizations for cricket and locust were identified.

Conclusion: The comprehensive analysis provided by this new tool will allow us to avoid, at least in part, the trigger tests, improving patients’ compliance, reducing costs and risks, and saving time. The discovery of new positivity might prevent adverse future episodes.
WAC23-0153
EVALUATION OF DIAGNOSTIC TESTS OF ALLERGIC RHINITIS AND/OR ASTHMA

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Background: To determine the relationship between the clinical features, history, family history, characteristics of the region where they live, and laboratory investigations who received at least one of the diagnoses of allergic rhinitis (AR) and/or asthma in the paediatric allergy outpatient clinic between January 2019-2021.

Methods: 583 patients aged 3-18 years reviewed retrospectively.

Result: Mean age was 7.8±3.6 years, 321 (55.1%) were males. %52 of patients had no history of atopy. The proportion of people living in urban areas (77.7%) was higher. Complaints lasted mostly throughout the year. The most common allergen with positive reaction (54.1%) was grass and grains. Phadiatop was not found positive in 42% of the patients, it was observed that the positivity of house dust mite, grass and grains, dog and cat epithelium was high in prick test in cases with positivity. Ragweed, which not in our city but has pollens in our atmosphere, created significant sensitivity. In this group, the number of patients with a total IgE level higher than 100 IU/ml. The number of patients diagnosed with asthma was higher in the group with a total IgE value of 500 IU/ml and above, compared to those below. There was also a statistically significant relationship between serum total IgE blood eosinophilia. Phadiatop positivity was found in some patients who were not sensitized to respiratory allergens in the prick examination.

Conclusion: Evaluating all of the symptoms and examinations of patients presenting with allergic disease symptoms as a whole and knowing the conflicting relationships between them will be very meaningful in terms of diagnostic accuracy.
WAC23-0172
SALIX CAPREA SENSITIZATION AMONG CHILDREN WITH ATOPIC SKIN DISEASES: AN UNCOMMON ALLERGEN IN MALAYSIA WITH UNIQUE MANIFESTATIONS

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Background: Salix caprea (goat willow) is an allergenic plant commonly found in regions with temperate climates. This study investigates the occurrence of Salix caprea sensitization among children with atopic skin diseases in Malaysia, a country where this allergen is not readily available, and exposure to pollen is limited.

Methods: A total of 67 children with atopic skin diseases underwent evaluation for Salix caprea sensitivity using standardized Protia Allergy-Q Elisa test kit.

Result: Out of 67 individuals tested, 15 (22.4%) were found to have a sensitivity to Salix caprea. Interestingly, a majority of those who tested positive were younger children who claimed to have no contact with willow pollen. This finding highlights the dual manifestation of Salix caprea sensitization suggesting a potential association between skin exposure and sensitization. It is hypothesized that exposure to ointments containing willow bark, which is a common practice among Malaysian children, may contribute to sensitization in this population. Given that Salix caprea pollen is not prevalent in Malaysia, exploring other possible means of exposure, such as topical products, is essential.

Conclusion: Understanding the unique manifestations and alternative routes of sensitization to Salix caprea in a nonendemic region is crucial for accurately diagnosing and effectively managing allergic skin diseases in affected individuals. Further research is warranted to elucidate the mechanisms underlying the dual manifestations and to explore preventive strategies and targeted interventions for this specific subgroup of patients.
WAC23-0174
TYROPHAGUS PUTRECENTIAE SENSITIZATION: A PILOT STUDY AMONG ATOPIC MALAYSIAN POPULATION

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Background: Within the last decades, allergy prevalence has increased among Malaysians. One of the emerging but underreported allergens is Tyrophagus Putrecentiae (T. Putrecentiae), which is a common cosmopolitan mite of stored products. We conducted a pilot study examining the prevalence of T. Putrecentiae sensitization and potential co-sensitization with other dust mites allergens among the Malaysian atopic population.

Methods: This cross-sectional study involves 109 pediatric and adult Malaysian atopic populations clinically diagnosed with allergic diseases. They were tested for serum sIgE against T. Putrecentiae in addition to combinations of other dust mites allergens using the Protia Allergy-Q Elisa test kit.

Result: Fifty-seven subjects (52.9%) were positive for T. Putrecentiae sIgE, with the commonest clinical manifestations being urticaria and rhinitis. T. Putrecentiae sensitized patients were shown to be concomitantly sensitized towards other house dust mites: Dermatophagoides Pteronyssinus, Dermatophagoides Farinae, and Acarus Siro, with significant positive association between T. Putrecentiae and these allergens tested (p<0.001). Additionally, it was observed that moderate to severe sensitization of T. Putrecentiae was significantly associated with similar sensitization strength of other dust mites allergens.

Conclusion: In this study, we reported a high prevalence of sensitization towards T. Putrecentiae with significant cosensitization to other dust mites allergens among atopic Malaysians. This highlights the need for testing T. Putrecentiae as it is an essential allergen that requires attention. It is also worth noting that including T. Putrecentiae in the treatment of dust mite allergies could prove to be beneficial.
WAC23-0178
THE SENSITISATION PATTERNS TO INDOOR ALLERGENS: THE RURAL VERSUS URBAN POPULATIONS WITH ALLERGY IN SOUTHERN INDIA

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Background: Allergy diseases are on increasing trend globally. The populations living in urban and rural areas might have a different pattern of sensitisation. In our study we have tried to find out the differences in the urban and rural populations’ sensitisation pattern in the presence of clinical evidence of Allergy.

Methods: This retrospective cross-sectional study included patients that attended the OPD in rural area: Ganadhal hospital, Tumakuru and OPD of urban area: VR Chest Clinic, Bengaluru. They underwent skin prick test (SPT) to indoor allergens. Study was performed between February 2022 to August 2022.

Result: We studied 189 patients, 84 urban and 105 rural patients. Amongst them allergic rhinitis was common in rural population, whereas asthma was more common in urban population. Both urban and rural population showed the highest common sensitivity pattern to D. pteronyssinus, whereas rural population showed second highest sensitivity to Blomia tropicalis (20%), the urban showed to D. farinae (35%).

Conclusion: House Dust Mite sensitivity is common in both urban and rural population. Males are more prone to allergy in rural population.
WAC23-0001
The Effect of an Educational Program for Children with Asthma on Airway Inflammation: Before and During the COVID-19 pandemic

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Background: Since 1978, Camp Wheez has been a free annual day camp for children with asthma. We aim to compare the effect our educational program had on airway inflammation as measured by fractional exhaled nitric oxide (FENO) during Camp Wheez in the years before and during the COVID-19 pandemic. Another aim of this study is to describe our experience of having an educational asthma program for children during the pandemic.

Methods: 125 children with asthma were enrolled in Camp Wheez 2018-2019 (before pandemic) and 2021-2022 (during pandemic). Written consent was obtained for each participant. We used the Asthma Camp Consortium curriculum provided by the AAAAI. The NIOX Vero was used as a 6 to 10 second, single breath, quantitative measurement. We measured FeNO on the first day and last day of camp.

Result: Before the pandemic, 2018-2019, the average FENO was 38.6ppb on the first day of camp and 34.9ppb on the last day of camp, which is a significant improvement in FENO (p=0.015). During the pandemic, 2021-2022, the average FENO was 26.2ppb on the first day of camp and 24.1ppb on the last day of camp, which demonstrated a nonsignificant difference (p=0.39). During pandemic years, no campers nor counselors developed symptoms nor tested positive for COVID-19 infection.

Conclusion: Overall, campers had a lower average FENO during Camp Wheez in the COVID-19 pandemic years as compared to the years prior. Potentially this could be attributed to improved asthma medication compliance and enhanced hygiene measures.
WAC23-0012
Identifying previously acquired bronchodilators with perfect concordance to asthma pathway reduces hospitalizations

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Background: Hospitalization rates decreased after introduction of the clinical pathway for acute asthma. However, studies focused on the benefits of perfect adherence to this are scarce. The aim of this study was to determine the efficacy of perfect concordance with asthma clinical pathway associated with hospitalization.

Methods: We conducted a study of Thai children aged 2 to 15 years with severe asthma exacerbations. Buddhasothorn Asthma Severity Score (BASS) was applied in conjunction with a clinical pathway for acute asthma management in the emergency department (ED). Patients treated with systemic corticosteroids plus a combination of nebulized short-acting beta 2-agonists and ipratropium bromides were classified as the perfect concordance group.

Result: All 118 episodes of asthma exacerbations (EAEs) from 59 participants were enrolled. Patients who completely adhered to the pathway had a significantly higher rate of systemic corticosteroid administration within 1 hour of triage arrival (88.6% vs. 41.9%, adjusted Odds Ratio: aOR 10.21; 95%CI 3.52–29.62). Likewise, for those who received inhaled ipratropium bromide ≥ 2 doses within 1 hour of triage arrival (72.7% vs. 12.2%, aOR 23.51; 95%CI 7.73–71.54) and it was also significantly faster, 31 minutes (5 minutes vs. 36 minutes, p < .001) than the non-adherence group. Hospitalization rate was significantly lower by almost half of EAEs for the perfect concordance group (36.4% vs. 63.5%, aOR 0.41; 95%CI 0.18–0.93), while there was no significant difference in the rate of revisits.

Conclusion: Accurate assessment of severity and perfect adherence to the clinical pathway can reduce hospitalization in patients with severe asthma exacerbations.
Incidence and causative agent distribution of viral-induced pediatric asthma exacerbations under strict infection control measures: a single-center retrospective study in Japan

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Background: Respiratory viruses in children have changed under strict infection control measures during the coronavirus disease 2019 (COVID-19) outbreak. In this study, we investigated the frequency of viral detection in the nasopharynx of pediatric patients with asthma exacerbation requiring hospitalization, as well the distribution of causative viruses.

Methods: We enrolled children hospitalized for asthma attacks (n=203) between November 2020 and December 2022 at a single center in Kobe, Japan. Demographic, clinical, and laboratory data were collected from their medical records and using additional questionnaires. We collected and analyzed nasopharyngeal samples from 189 patients. Statistical differences were calculated using univariate analyses (chi-square or Mann-Whitney U test).

Result: The median patient age was 3.0 years. Asthma severity was classified as mild (4.0%), moderate (82.3%), or severe (13.8%). The proportions of viral respiratory infections and superinfections were 95.2% (180/189) and 20.6% (39/189), respectively. The most frequently detected pathogens were rhinovirus and enterovirus (RV/EV) at 69.3% (131/189), allowing for duplicate detection, followed by respiratory syncytial virus (RSV) at 28.6% (54/189). We also detected RV/EV almost every month, compared to RSV and other viruses. In addition, statistical differences were observed between patients with and those without RV/EV infections in age (p=0.02), white blood cell count (p<0.01), eosinophil count (p<0.01), total IgE level (p<0.01), house dust mite-specific IgE level (p=0.02), duration of hospitalization (p<0.01), and duration of oxygen therapy (p<0.01).

Conclusion: Even under strict infection control measures, respiratory viruses were detected in the nasopharynx of almost all pediatric patients who had asthma exacerbations requiring hospitalization.
WAC23-0049
Atmospheric environment and persistence of pediatric asthma: Data linkage study between Korea childhood asthma cohort and national claim data

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Background: Asthma is a heterogeneous disease with different outcomes. We aimed to investigate factors associated with persistence of childhood asthma over three years of follow-up by linking data between Korea childhood Asthma Study (KAS) and their matched claims data from Health Insurance Review and Assessment Service (HIRA).

Methods: We analyzed data of 450 preadolescent children aged 7 to 10 years children and classified them into remission or persistence groups. Baseline clinical characteristics and exposure to air pollution materials including PM2.5 and PM10 during three years of follow-up were compared. The main outcome was asthma persistence which was defined as the presence of asthma episodes within three years after KAS enrollment. Asthma episodes were defined as healthcare utilization with an asthma code and being prescribed asthma medications.

Result: At the third year of follow-up, male sex, lower onset age of asthma, proximity from an air polluting factory, waste incineration plant, or landfills was associated with persistence. Of air-pollution materials, exposure to outdoor PM2.5 was significantly higher in the persistence group. After stepwise regression analysis, lower age at enrollment, sex, higher level outdoor PM2.5, and higher rate of doctor-diagnosed food allergy (FA) were significantly associated with persistence.

Conclusion: Male sex, lower age of enrollment, doctor-diagnosed FA, proximity to an air-polluting factory, waste incineration plant, or landfills, and exposure to higher level of outdoor PM2.5 were independent risk factors for the persistence of childhood asthma. By linking HIRA claims data, we could clarify risk factors for persistence in a well-defined study population.
WAC23-0051
Longitudinal trajectories of childhood asthma phenotypes and allergic comorbidities in Korean childhood Asthma Study (KAS)

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Background: Asthma is a heterogeneous airway disease with various clinical phenotypes accompanied with other allergic comorbidities in children. The aim of this study was to define and validate clinical asthma phenotypes and other allergic diseases using cohorts of Korean children from their birth to adolescent period.

Methods: This study enrolled 958 children with physician-diagnosed asthma from the Korean childhood Asthma Study (KAS) cohort. Children with asthma were classified by hierarchical cluster analysis. Participants’ past medical records of diagnosis and treatments relating asthma, allergic rhinitis (AR), and atopic dermatitis (AD) were acquired from the Health Insurance Review & Assessment Service.
**Result:** Of the 958 patients in the KAS cohort, about half of patients had a history of atopic dermatitis before in infancy, and the prevalence gradually decreased toward adolescence. The prevalence of allergic rhinitis increased in school age as we expected. Among those children, 794 were included in cluster analysis. Four phenotypes were identified in the KAS cohort with distinct clinical trajectories of allergic comorbidities. Cluster 1 was “Male dominant atopic asthma”. Cluster 2 had an “early onset atopic asthma with AD” with persistent AD until adolescence. Cluster 3 was a “Puberty onset female dominant atopic asthma” phenotype with low pulmonary function and low remission rate asthma and progressing AR. Cluster 4 had a “Early onset less atopic asthma” with the lowest comorbidities of AD and AR.

**Conclusion:** Identification of asthma phenotypes and their allergic comorbidities based on baseline cluster analysis may facilitate prediction of prognosis and response to treatment.
WAC23-0300
Study of inhalant allergenic components that cause allergy among Thais

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Background: Allergic rhinitis affects millions globally, with a prevalence of up to 30% in Thailand. The standard diagnostic test involves detecting serum specific IgE (sIgE). An emerging molecular-based allergy diagnostic test known as component resolved diagnosis (CRD) identifies responses to major allergenic proteins rather than using crude extracts. This study aims to investigate inhalant allergens causing allergies among Thais using CRD.

Methods: The study enrolled an adult population (age ≥ 18 years old) who tested positive for skin prick tests (SPT) to any of the following allergens: Dermatophagoides pteronyssinus (DP), American cockroach, and dog hair. CRD results were compared with crude extract serum sIgE, with SPT as the reference. The prevalence of major allergens was examined, and the agreement between SPT and either sIgE or CRD was compared.

Result: A total of 115 participants were recruited. For DP allergy (n=101), 41.38% of tested positive for sIgE. CRD identified 91.95% as positive for Der p 1, 77.65% for Der p 2, and 49.43% for Der p 23. For cockroach allergy (n=55), 32% tested positive for sIgE. CRD revealed positivity rates of 72%, 76%, 64%, and 88% for Per a 1, Per a 5, Per a 7, and Per a 9, respectively. For dog allergy (n=35), 40% tested positive for sIgE, while CRD showed 75% and 70% positivity for Can f 1 and Can f 5. Additionally, CRD findings demonstrated better agreement with SPT wheal sizes compared to crude extract sIgE.

Conclusion: The major allergens detected by CRD significantly enhance the precision of allergic rhinitis diagnosis.
WAC23-0319
Multi-Omic Analysis of P. clarkii Shed Light on Its Allergen Profile

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Background: Crustacean shellfish is among the eight most common food allergens, and crayfish is a highly valued shellfish species for consumption in China. However, the detailed allergen profile of crayfish remains unknown, with only four allergen groups reported in the WHO/IUIS allergen nomenclature database.

Methods: We assembled the crayfish genome using both long-read and short-read data and identified putative allergens using the BLAST algorithm based on sequence homology. We applied indirect ELISA using patients' sera to determine allergenicity and utilized proteomic methods to identify novel allergens.

Result: We identified a total of 14 putative allergen groups, including all isoforms or homologs for each allergen group based on the genome. Through our investigations, we confirmed two novel allergens, Pro c 3.0301 and Pro c 6.0201, which had allergenicities of 33.3% and 20%, respectively.

Conclusion: By providing a comprehensive understanding of the complete allergen profile, our study presents a foundation for comprehending P. clarkii-associated allergy. The knowledge gained could facilitate the implementation of a components-resolved diagnostic test and preventive immunotherapy based on molecular allergens for crayfish allergy.
WAC23-0093
Effect of asthma treatment on quality of life of rural children in India

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Background: Medications relieve symptoms of asthma but affected children are significantly bothered by physical, social, educational and emotional impairments. There is hardly any data from India on how this disease affects quality of life of affected children in rural setup.

Methods: This was a prospective study done after getting ethical approval from the Institutional Review board. Asthmatic children 7 to 17 years in age were included. Asthma clinical severity using the Asthma Clinical Severity Score (ACS) and QOL using the Pediatric Asthma Quality of Life Questionnaire - Standard (PAQLQ) were measured at the time of inclusion and four weeks after treatment. The PAQLQ assessed the QOL under symptoms, activity limitation and emotional function domains. Mean difference in pre and post treatment PAQLQ score was assessed.

Result: Total 46 children were included. 60.86% were male and 54.34% belonged to 7-11 years age group. Majority (54.30%) had normal BMI while 28.36% were undernourished. Only 18.38% were either overweight or obese. 4.34%, 71.73% and 23.91% had mild, moderate and severe asthma respectively. All three domains showed significant improvement after four weeks treatment. Pre and post treatment mean PAQLQ were 4.2568 ± 0.1641 and 5.5483 ± 0.3862 respectively with a statistically significant mean difference of -1.2915 (P < <0.003).

Conclusion: Treatment of asthma significantly improves QOL (in all domains) resulting in better overall personality development of rural asthmatic children. Policies should aim to improve awareness to get children properly treated for asthma.
WAC23-0112

House dust mite sublingual immunotherapy prevents lung function decline in children and adolescents with asthma.

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Background: Recent studies showed that lung function of a subgroup of children and adolescents with asthma declined despite ICS treatment and poses a risk of unfavorable outcomes in later life such as COPD. Sublingual immunotherapy (SLIT) is a potential disease-modifying intervention and may prevent lung function decline.

Methods: Children and adolescents who had house dust mite (HDM)-sensitized allergic rhinitis and mild-to-moderate asthma were invited to join the prospective observational study for 3 years. They were divided into 2 groups who underwent SLIT or not (SLIT/Control) by their preference, in conjunction with regular asthma/rhinitis controllers including ICS. We evaluated the forced expiratory volume 1 (FEV1) with % predicted values and individual yearly changes by linear regression.

Result: A total of 37 patients, 19 boys and 12 girls, were enrolled and data from 31 patients who completed 2-year observation were analyzed. The majority completed 3-observation except for 5 awaiting the final check-up. The SLIT and Control groups consisted of 19 and 12 patients, respectively. The mean age at enrollment was 11.1 and 10.4 and gender ratio, %FEV1, and HDM-specific IgE levels were comparable between the groups. The changes in %FEV1 from enrollment to the second year were significantly higher in the SLIT than in the Control group (P=0.0318). Median annual changes in %FEV1 were +0.12% in the former and -1.6% in the latter (P=0.0531).

Conclusion: HDM-SLIT may prevent lung function decline in children and adolescents with asthma.
WAC23-0113
Epidemiology of asthma cases in the Allergy service from a third level medical center

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Background: Introduction. Because of the high frequency of allergic diseases among paediatric population, the allergy service was created in July 2005 to attend properly this group of patients in the general consultation of a third level medical centre. Objective. The purpose of this study is to report the cases of asthma diagnosed from July 2005 to December 2022.

Methods: This is a descriptive, retrospective, transversal study between the period mentioned above. Selected medical records of patients apply for diagnostic criteria according to an updated GINA guide used to make diagnosis of asthma. Patients were classified by age and sex.

Result: 5845 medical records of patients were registered. 1070 patients completed criteria for diagnosis of Asthma. Distribution of patients by age and sex showed that 509 (47.5%) patients were female, 561 (52.4%) patients were male. 584 (54.5%) patients were found to be in the range of 0 – 9 years. The majority of asthma patients were males in the range of 5-9 years with 199 (18.5%) patients. Increase in asthma cases were found in females between 30-40 years of age, 136 of total female cases, about 15% of total cases of asthma in female patients.

Conclusion: Asthma has a high incidence in among children. Is the main cause of hospitalization that increases the cost of medical attention. Early diagnosis of asthma helps to adequate treatment and education to these patients.
Use of Mepolizumab for the management of difficult to treat eosinophilic asthma / Suspected Churg Strauss syndrome

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Background: This case report is of a patient who has difficult to treat asthma and diagnosed with possible Churg-Strauss syndrome, a rare disorder that affects multiple organ systems, especially the lungs.

Case study: The patient is an 11 year old female who was born prematurely at 33 weeks gestation and had a low birth weight of 2 kilograms. Prior to the age of 8, she had three respiratory associated hospital admissions. Thereafter, she had recurrent chest related problems and difficult to treat asthma. She also developed multiple systemic manifestations of Churg Strauss syndrome including the Anti-Neutrophil Cytoplasmic Antibody negative vasculitis, Pansinusitis (had sinus surgery with polypectomies), chronic abdominal pain, maculopapular rash, peripheral blood smear eosinophilia, allergic rhinitis and confirmed nephrotic syndrome. Despite being on Vannair 160mcg/4.5mcg 2 puffs twice daily, Spiriva 2 inhalations daily, Mycophenolate Mofetil (for suppression of the vasculitis and nephrotic syndrome) 250mg twice daily, her lung functions remain poor and has multiple exacerbations of wheeze; sometimes requiring admission.

Conclusion: Mepolizumab is approved by the FDA for the treatment of difficult to control eosinophilic asthma above the age of 6. It is also approved for the treatment of Churg-Strauss syndrome in adults. It is unfortunately not available routinely in South Africa. The authors believe that this child has some of the features of Churg-Strauss syndrome and the entire syndrome will evolve. For now her eosinophilic type of asthma remains poorly controlled despite maximum doses of available agents. The authors await approval and commencement of Mepolizumab for this child.
Quality of life after using peak flow monitoring application in childhood asthma

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Background: Asthma is one of the most common chronic diseases in childhood. Due to the Coronavirus disease (COVID-19) pandemic, monitoring peak expiratory flow rate (PEFR) at home is recommended for patients with asthma. We hypothesized that an electronic PEFR meter that automatically saves data onto a paired app would lead to improved quality of life.

Methods: Children aged 7-17 years with asthma were evaluated for pediatric asthma quality of life questionnaire (PAQLQ), asthma severity, and medication use at the enrollment and 3 months after. They were asked to use electronic PEFR meter twice daily.

Result: Of 71 children, the mean age was 11.41 years, 61.98% were male. The median duration of ICS use was 4.58 (3.17-7.92) years, and 42 children (59.2%) had moderate persistent asthma. Twice daily compliance of PEFR measurement dropped from 50% to 39.89% after 3 months. Children with good compliance (defined as ≥50% PEF meter usage) trended to have a better PAQLQ score after using the peak flow meter (p-value <0.001). A significant difference in the duration of ICS use was observed (3.83 years vs. 6.38 years in children with good and poor peak flow compliance, respectively, p-value 0.014). Fourteen patients were infected with COVID-19, and a significant decrease in PEFR and an increase in peak flow variability were observed during the COVID-19 infection period.

Conclusion: The routine use of electronic PEFR meter improved PAQLQ. The peak flow meter plays a significant role in monitoring disease progression, particularly in patients with respiratory tract infections.
WAC23-0191
Characteristics of small airways dysfunction in asthmatic children in Children’s hospital 1

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Background: Small airway dysfunction (SAD) is suggested to play an important role in the pathophysiology of asthma and contribute to poor control of the condition. Recently, the impulse oscillometry (IOS) is developed to assess small airways more accurately than the conventional spirometry.

Methods: A cross-sectional study conducted at the Pulmonology department of Children’s Hospital 1 from September 2020 to June 2021. A total of 118 participants was included in the study, who were 3 to 16 years of age, diagnosed with asthma, and were able to perform impulse oscillometry. A correlation between respiratory symptoms and IOS parameters was assessed.

Result: Prevalence of SAD in asthmatic children was 42.4%. Obesity (OR= 2.86), nocturnal symptoms (OR= 2.28) were associated with SAD. The frequency of hospitalizations and asthma exacerbations in group with SAD was significantly higher than the group with normal respiratory function (p<0.05). By using ROC analysis, the optimal cut points for differentiating controlled with uncontrolled asthma are baseline total airway reactance (X5) and area of reactance (AX) at -0.36 kPa/L/s; 2.8 kPa/L, respectively with (AUC=0.68).

Conclusion: Small airways dysfunction is associated with uncontrolled asthma. Impulse oscillometry is a reliable objective and noninvasive measurement of lung function to examine small airway impairment in children, providing useful information in addition to the result of traditional spirometry.
Omalizumab treatment in a patient with severe uncontrolled asthma improving asthma control but slightly improve pulmonary function.

Background: Severe asthma affects 5-10% of the asthma patients and significantly impacts the patients' quality of life. Biological treatments, such as anti-IgE antibody (e.g., omalizumab), have demonstrated effectiveness in improving asthma control, decreasing the asthma exacerbation rate, and improving lung function in type 2-high (T2) asthma.

Case study: This case report presents a 16-year-old male with asthma and allergic rhinitis which first manifest at the age of 9. Despite receiving high-dose inhaled corticosteroids with long-acting beta2 agonists, oral bronchodilators (doxyfylline), and leukotriene receptor antagonists, he experienced frequent asthma exacerbations (8 times per year). Type 2 inflammation was suspected due to elevated blood eosinophil levels (266 cells/μL), elevated total IgE levels (1,110 IU/ml) and sensitization to house dust mites and cockroaches. Therefore, omalizumab was prescribed as an add-on therapy. After five year of omalizumab treatment, decreasing the exacerbation rate and slight improvement in pre-bronchodilator FEV1, FVC, and PEF 25-75 was observed. However, he still experienced exercise-induced bronchospasm. A repeated skin prick test after five years yielded negative results, thus anti-interleukin 4 receptor alpha was prescribed instead of omalizumab. His asthma symptoms were controlled, despite low FEV1, and PEF 25-75 was still observed.

Conclusion: Omalizumab appears to be beneficial in asthma control and improving the quality of life in patients with moderate to severe T2 asthma. However, in this patient, there was some impact on the improvement of clinical symptoms but slightly improve of lung function. Furthermore, we observed a suspected change in the pattern of aeroallergen sensitization during the five-year follow-up.
Coping the Challenges Between Exacerbations in Severe Persistent Asthma with Bronchiectasis in Children: A Case Report

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**Background:** Asthma and bronchiectasis are both chronic airway diseases with different pathogenesis. The natural history of bronchiectasis leads to uncontrolled asthma due to airway remodeling as a contributing factor to treatment difficulty. This case describes the challenges of long-term management of severe persistent asthma with bronchiectasis.

**Case study:** An 8-year-old girl with persistent asthma presented with worsening dyspnea 7 days prior to admission, with no previous history of infection. She was an asthma exacerbation and infective bronchiectasis. She had been diagnosed with persistent asthma since three years ago and regularly takes fluticasone-salmeterol 250 mcg inhaler BID. She had a history of tuberculosis at age 2 years old and recurrent pneumonia since then. Seven months ago, she had aggravated pulmonary hypertension and routinely required oxygen supplementation since then. Her physical examination showed coarse wet rales and wheezing in all lung fields. Blood examination obtained normal blood count, elevated CRP, normal procalcitonin, and respiratory acidosis with hypoxemia. There was no germ growth in both blood and sputum culture. Chest X-ray found infiltrates accompanied by a picture of ectasis rings in the perihilar and paracardial bilaterally. Thoracic CT scan revealed central cylindrical- and varicoid bronchiectasis with bronchiolitis, bilateral mosaic attenuation, and cardiomegaly with signs of pulmonary hypertension. The dyspnea improved after 17 days of treatment with antibiotics and macrolides as antiinflammation. Oxygen requirements began to decrease considerably after the infection was resolved and pulmonary hypertension was controlled.

**Conclusion:** The presence of infected bronchiectasis with aggravated pulmonary hypertension lead to difficulty to relieve asthma exacerbation in patient with both diseases.
WAC23-0321
Long-term asthma outcomes in a retrospective cohort study of asthmatic children in Hong Kong

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Background: Since the development and progression of asthma are affected by multiple factors from childhood to adulthood, this retrospective cohort study of 52 adults with childhood-onset asthma explored the natural history of asthma at their baseline visit and two follow-up visits in 2014 and 2022.

Methods: Demographic data and clinical status (disease severity and medication use) were retrieved from chart review. Clinical assessments of patients included spirometry (forced expiratory volume in 1-second, ratio of forced expiratory volume in 1-second to forced vital capacity), exhaled nitric oxide, skin prick test (SPT) and serum total immunoglobulin E.

Result: The mean (SD) age of asthma onset was 3.0 (2.2) years. Half of them (53.2%) also had eczema, and majority (83.9%) had a family history of allergic diseases. The main reasons for referral to the allergy clinic were asthma attacks (43.5%) and food allergies (37.1%). At mean (SD) follow-up of 18.7 (4.4) years, 27 patients (43.5%) were free from any asthma symptoms and use of anti-asthma medications for more than 2 years (i.e. outgrown). Eighteen patients (29%) had controlled asthma by 2022. The use of short-acting beta 2-agonists and inhaled corticosteroids decreased from 2006 (54.8%, 16.1%) to 2022 (30.6%, 3.2%). Over 80% of patients with SPT were strongly positive for house dust mites. Eighty percent of patients had raised serum total IgE level. Most patients had normal lung function but half of them had high exhaled nitric oxide level.

Conclusion: To conclude, most properly-treated asthmatic children outgrow their asthma by adulthood.
Asthma and chronic lung disease after hospitalization for adenovirus infection in childhood: A register-based cohort study

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Background: The aim of the study is to examine the association between early respiratory tract infection with adenovirus (AV) and development of chronic lung disease, a subject that can be important with respect to discussions on prophylactic measures regarding childhood asthma. We will furthermore compare this risk with the risk of similar diseases in individuals hospitalized with RSV during childhood.

Methods: Cases: Children infected with AV and RSV aged 0 – 35 months are identified from the Department of Virology, Statens Serum Institut and from the Department of Microbiology, Slagelse Hospital. Outcome_ Discharge diagnoses or outpatient diagnoses of asthma, bronchiectasis and diffuse lung disease until 31.12.2020. Analyses are adjusted for mode of birth (vaginally vs. SC, Gestational age at birth, birth weight, Small for gestational age, appropriate for gestational age, large for gestational age and Apgar score after 5 minutes Follow up: All children will be followed until end of follow up on 31.12.2020

Result: Because the material size is limited by the number of children with detected AV (67 vs 155 kontrol RSV) we includet 5 controls per case matched on date of birth with the index patients from Danish patients register.

Conclusion: Patients with a positive AV have a 4.9 times higher risk (hazard rate) than their respective controls for outcome 1, which is defined as the date of outpatient diagnosis or discharge diagnosis with asthma, bronchiectasis or interstitial lung disease until 31.12.2020, and at least one prescription on asthma medication before diagnosis or up to 6 months after.
Allergy in Children’s Population

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**Background:** Goal of work included study of prevalence of allergic diseases and risk factors in the children’s populations of Georgia (2022-2023).

**Methods:** Studied group included 899 children from 1- to 14 (girls – 51.8%; boys – 48.2%). At the first stage including screening of 1899 children through questionnaire. On the second stage studies patients with allergic diseases (315 children). At the same stage was studied, general IgE level and prick-testing. At the last stage study mathematical-statistical data processing was provided by means of software SPSS/V12.

**Result:** In the population number of girls exceeded the one of boys (p<0.001). The results of questioning, for 12 months, symptoms of allergic rhinitis (rhinorrhea, sneezing, nose itch, nasal obstruction and eyes’ itch) were identified in 16.7 of population (p<0.05); symptoms of bronchial asthma (wheezing (9%), coughing episodes at night (5.7%), intolerance to physical load (3.9%), indoor and outdoor episodes (11.2%), episodes of coughing and rates in response to stimulus (7.2%)) were identified in 9.8% of the population; atopic dermatitis (dermatitis, itch, damage of extremities bending and stretching surfaces in adults) – 4.9% (p<0.01); food allergy – 9.7% (p<0.001). At the second stage, on the basis of prick-testing, average IgE, was 1-4 times greater than normal level. Showed sensibilization to domestic dust (D.F. and D.P.) (75, 04%) (p<0.05). In 24.96% of cases there was stated sensibilization conditioned by cat and dog epidermal allergens.

**Conclusion:** In development of allergic diseases risk factors is quite high and this could provide basis for development of targeted prevention in children’s population.
WAC23-0339  

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Background: Pediatric asthma is a heavy burden in the healthcare system worldwide. The increased prevalence of asthma was reported in the world and Taiwan in the late 20th century. Recently, the prevalence of asthma in children was reported to be stable or decreased in several countries. Scare studies evaluated the prevalence of asthma in children in Taiwan in recent years.

Methods: A nationwide population-based retrospective study to investigate the prevalence of physician-diagnosed asthma in 13-14 years old children from 2004 to 2017 in Taiwan was conducted. The children with asthma diagnoses in three OPD visits or one hospitalization plus at least one-time use of anti-inflammation medication during the previous year were enrolled for analysis.

Result: From 2004 to 2017, the one-year prevalence of asthma differed from 1.87% to 0.69% in 13-14 years of age children with a peak of 1.87% in 2006. We found the trend of asthma prevalence changed to decrease from 2004 to 2017. The trend of one-year prevalence decreased in 13-14-year children with R2 values of 0.9897 (p <0.001).

Conclusion: The increasing trend of prevalence of asthma had changed to a decreased trend in 13-14 years old children in Taiwan. Further studies are needed to investigate the etiology related to the decrease in the prevalence of asthma.
Changes in Viral Etiologies of Childhood Asthma and Wheezing Before, During, and After the COVID-19 Pandemic

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Background: To determine the impact of COVID-19 pandemic on viral etiologies of childhood asthma and wheezing.

Methods: This study prospectively recruited children admitted to Prince and Wales Hospital, a tertiary hospital in Hong Kong, due to asthma and related wheezing disorders between September 2016 to April 2023. Nasopharyngeal aspirates were obtained on admission and subjected to immunofluorescence-based rapid antigen detection followed by multiplex PCR testing to detect 11 common respiratory viruses.

Result: We recruited 1,554 children (male 67.6%) with 2,097 admissions due to wheezing disorders during the study period. The mean age (± SD) at first admission was 3.5 ± 3.2 years. Compared with the pre-pandemic period, there was a remarkable reduction in wheezing admissions during the COVID-19 pandemic. The most evident drop was in admissions due to “bronchiolitis”, falling from 15.4 cases per month pre-pandemic to 2.0 cases per month during the pandemic. Rhinovirus (RV) prevailed during the pandemic with a prevalence rate of over 80% among children hospitalized for “wheezing illness”, compared with 51.9% before the pandemic (P < 0.001). Upon removal of pandemic regulations in Hong Kong earlier this year, the number of wheezing cases per month has surpassed the pre-pandemic level. The post-pandemic proportion of RV and respiratory syncytial virus (RSV) significantly increased in children diagnosed with “asthma” and “bronchiolitis”, respectively, compared to pre-pandemic and during pandemic periods (P = 0.008 and 0.028, respectively).

Conclusion: Our results indicate a rebound risk of RV and RSV infections, highlighting the importance of continued surveillance of common respiratory viruses in the post-pandemic era.
**WAC23-0028**

**Two Decade analysis of Aeroallergen with a special Reference to PM2.5 in increase in allergy and asthma cases**

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**Background:** The study of air quality and aerobiology is an important field and contributes to advancing the scientific body of knowledge and understanding the world around us. Capturing, identifying, and quantifying airborne particles are important to understanding air quality. We have been analyzing the aeroallergen concentration and combination for twenty two years and correlating the count and variation of aeroallergen with the patients suffering from allergy and asthma using the data from the local allergy clinics. Our research focused on specific particulates including pollen, fungal spores and PM2.5. We conducted laboratory-controlled experiments using a fiberglass chamber and various air quality monitors to assess and evaluate PM2.5 concentrations.

**Methods:** We used a Burkard Volumetric Spore Trap placed on the third floor roof of the NSB building of the West Texas A&M University, Canyon, Texas. The exposed tapes from Burkard Volumetric Spore Trap were stained and mounted with SafraninGelvatol mixture and were observed using an Olympus BX40 microscope equipped with FITC, TRITC filters, a mercury lamp source, a DP-74 digital camera. Aeroallergens were viewed, recorded and analyzed with CellSens software.

**Result:** A significant correlation was evident between the aeroallergen indices and the patient visits. Anomalous shift in the aeroallergen was recorded with the incidence of wildfire. We also recorded and analyzed the seasonal variation of the aeroallergen concentration in Howrah, India, investigated the cases of allergic rhinitis and allergy. Aeroallergen indices correlated with the number and severity of allergy and asthma cases.

**Conclusion:** Seasonal variation of aeroallergen, PM2.5 caused a significant fluctuation in allergy cases.
WAC23-0073
Vitamin D supplementation reduces egg white sensitization. A Randomized, Double-Blind, Placebo-Controlled Study.

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Background: Recent studies have shown that vitamin D (VD) deficiency in mothers and children is frequent and that low VD levels may be closely related to sensitization and allergy development. However, whether VD can prevent food allergy remains controversial. We conducted the D-PAC study (Vitamin D mediated Prevention of Allergic march in Chiba) to determine whether VD can prevent sensitization to food allergens.

Methods: D-PAC study is a randomized double-blind, placebo-controlled trial of VD supplementation conducted in Chiba City, Chiba, Japan. 400IU vitamin D3-cholecalciferol syrup or placebo syrup once daily are administered until six months of age. We checked the sensitization rates of egg white and VD levels in the infant’s sera at 6 and 12 months.

Result: In total, 246 babies were randomized to the placebo group or the VD group. 87% of the mothers were VD deficient(25(OH)D3 <20 ng/mL) in this study. VD levels of infants at the age of six months were significantly higher in the VD group (Mean 40.8 ng/mL) compared to the placebo group (Mean 27.5ng/mL). However, VD levels of infants at the age of one year were almost the same in both groups (27.2 vs 28.0 ng/mL). Egg white sensitization rates were significantly lower in the VD group (33.3%) compared to the placebo group (17.0%).

Conclusion: Vitamin D supplementation from the neonatal period reduces egg white sensitization in low VD level populations.
**WAC23-0145**

**CFD Modeling for Optimizing Allergen Exposure Chamber Design: Achieving Uniform Particle Distribution**

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**Background:** Allergen exposure chambers (AECs) play a critical role in respiratory disease research and allergy therapeutics validation. The objective of this study was to optimize the design of a new AEC using computational fluid mechanics (CFD) to achieve a uniform particle distribution at the participant level.

**Methods:** The AEC was modeled using ANSYS software. Transient flow fields were solved by applying the Unsteady Reynolds-Averaged Navier-Stokes equations with a shear-stress-transport turbulence model. Pollen particles were introduced at specific ceiling points and tracked over time. Oscillating mixing fans at each wall simulated airflow patterns. Particle volume fraction analysis focused on assessing uniformity at the participants' head level.

**Result:** The uniformity of particle distribution was influenced by all tested variables, but was particularly sensitive to the mixing fan configuration and flow rate. Inadequate flow resulted in a concentration of particles at the center of the chamber, while increased flow significantly improved dispersion.

**Conclusion:** CFD modeling proved to be a valuable tool in optimizing AEC design, enabling the identification of optimal parameters for achieving a uniform particle field. Experimental validation will be conducted to further confirm these findings.
Oil Massage in Infancy: A novel approach to prevent food allergy?

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Background: A strong link exists between early onset atopic dermatitis (AD) and development of allergic diseases later. Evidence suggests that early use of emollients can prevent skin epithelial barrier dysfunction and AD. Aim of study was to determine association of traditional Indian oil massage in infancy and food allergy later in life.

Methods: Patients (n=1340) suffering from various allergic diseases were included in study. History of oil massage in infancy was asked for and Skin prick test was conducted. Correlation of aeroallergen and food sensitisation was done with history of massage and p value of 0.05 was considered significant.

Result: Of 1340 patients, aeroallergens sensitization was seen in 831(62%) and of the 563(42%) patients with perceived food allergy (on history), 241(18%) were sensitized to food allergens. 1032(77%) had massage in infancy period, 188(14%) were unsure and 120(9%) denied it. Patients who received oil massage in infancy period, 188(14%) were unsure and 120(9%) denied it. Patients who received oil massage in infancy had lower rates of aeroallergen sensitisation (532/1032 Vs 117/120, p<0.00001; RR=0.53) and food allergen sensitisation (43/1032 Vs 111/120, p<0.00001; RR=0.05). The values remain significant even when the unsure group was merged with either of the groups. The strength of association was stronger with food allergens as compared to aeroallergen.

Conclusion: The traditional Indian culture of Oil massage from birth may represent a novel approach to primary prevention of atopic dermatitis and food allergy later in life.
WAC23-0250
Association between urinary 1,3-butadiene metabolite during maternal pregnancy and oxidative stress-mediated childhood asthma: ECHO-COCOA study

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Background: 1,3-butadiene (BD) is a volatile organic compound ubiquitous in the environment. Exposure to BD has been associated with childhood malignancies, but its association with childhood asthma is unclear. Prenatal period is the most critical time for the effects of environmental exposures on the development of asthma. This study aimed to investigate the relationship between maternal BD exposure and childhood asthma and whether reactive oxidative stress-related genetic polymorphisms modify this effect.

Methods: N-Acetyl-S-(3,4-dihydroxybutyl)-L-cysteine (DHBMA) was used as a biomarker for BD and was measured in 242 maternal urines from COCOA birth cohort by an ultraperformance liquid chromatograph-tandem mass spectrometer. Diagnosis
of asthma by a doctor at age 3 was determined using questionnaire and atopy was determined by skin prick test. The Nrf2 (rs6726395) and GSTP1 (rs1695) polymorphisms of cord blood were genotyped by using a TaqMan assay (ABI, Foster City, CA, USA).

**Result:** Maternal urinary DHBMA increased the risk of asthma (aOR: 1.005, 95% CI: 1.000-1.009), especially in children with atopy (aOR: 1.008, 95% CI: 1.000-1.016). In children with NRF2 GA/AA and GSTP1 AA genotype, maternal urinary DHBMA had significant associations with asthma, indicating that oxidative stress induced by BD exposure may have an impact on childhood asthma.

**Conclusion:** This study suggests that maternal exposure to BD may be associated with childhood atopic asthma through oxidative stress. Interventions to prevent pregnant women from BD exposure may reduce the risk of asthma in children.
Aqueous and Alcoholic Extracts of allergenic pollens exhibit cytotoxic effect on tumor cell lines

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Background: Breast cancer (BC) and lung cancer (LC) are among the most common cancers worldwide. Pollens are a rich source of bioactive components with different properties. Studies have reported antioxidant, anti-inflammatory, cytotoxic and anti-parasitic effects for allergenic pollen but, there is no data about the anti-cancer effects of pollens. The aim of this study was to evaluate the anti-cancer effects of aqueous and alcoholic extracts of some allergenic pollen on two cancer cell lines.

Methods: Pure pollen of five allergenic pollens including Amaranthus, Chenopodium, Artemisia, Juniperus, and Cypress were purchased and aqueous and alcoholic extracts were made from each pollen. Two tumor cell lines including MCF-7 (breast cancer), A549 (lung cancer) and normal fibroblast cell line and were seeded in culture plate and different concentration of each extract as well as culture media and methotrexate were added to cultured cells. The effects of extracts on cell viability in three time points of 24, 48 and 72 hours was assessed by MTT method.

Result: Both the aqueous and alcoholic extracts of studied pollen had considerable growth inhibitory effects which was greater for alcoholic extracts and pollen extracts of Artemisia and Cypress showed the lowest IC50 values. While all the aqueous extracts had no cytotoxic effect of normal fibroblast cell line, most of alcoholic extracts showed cytotoxic effect on normal cell line but to a lesser extent than tumor cell lines.

Conclusion: The results of this study, confirmed the anti-proliferative of some allergenic pollen.
Higher Anxiety, Stress, and Suicidal Behaviors in Allergic Adolescents: A nationwide Korea Youth Risk Behavior web-based Survey

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Background: Asthma and other allergies have been linked to psychological distress and suicidal behavior in adolescents, a concern amplified by the COVID-19 pandemic's mental health impact. This study examines the relationship between allergic diseases and distress/suicidal behaviors in South Korean adolescents using the 2022 Korean Youth Risk Behaviour web-based Survey (KYRBS) data.

Methods: We analyzed self-report data of 2022 KYRBS, focusing on the diagnosis status of asthma, allergic rhinitis, and atopic dermatitis, and measured levels of stress, Generalized Anxiety Disorder Assessment (GAD-7) scores, and suicidal behaviors (ideation, planning, and attempts).

Result: From a total of 51,850 evaluated participants, the reported prevalence of current asthma, allergic rhinitis, and atopic dermatitis were 1.1%, 16.7%, and 5.9%, respectively. The prevalence of significant anxiety (GAD-7 score of >=10), stress, and suicide ideation, as well as planning and attempt, were 12.7%, 41.3%, 14.2%, 4.5%, and 2.7% respectively. Adolescents with current allergic diseases showed the highest prevalence of anxiety, stress, and suicidal behaviors, followed by those with previously diagnosed diseases, and least among those who had never experienced allergies (p trend, all < .001). Furthermore, a significant increase in these psychological distress measures was observed as the number of current allergic diseases increased (p trend, all < .001).

Conclusion: Allergic adolescents, particularly with current and multiple allergies, exhibit higher anxiety, stress, and suicidal behaviors, underscoring the need for holistic healthcare strategies during widespread health crises.
WAC23-0047
KIMURA DISEASE: A RARE CASE IN VIETNAMESE WOMAN

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Background: Kimura disease (KD) is a rare benign chronic inflammatory condition that predominantly affects Asian males. It is characterized by subcutaneous tissue masses in the head and neck region, enlarged lymph nodes, increased blood eosinophilia, and elevated serum IgE levels. In this report, we describe a rare case of KD in a young Vietnamese female.

Case study: A 31-year-old Vietnamese woman presented to the hospital with 2 masses in the bilateral cheeks and 1 mass behind the left ear that persisted for 15 years, recurrent skin itching, elevated serum IgE levels and increased blood eosinophilia. No medical history of the individual or their family was recorded. We performed an excision biopsy of the postauricular mass which revealed follicular hyperplasia with small vessel hyperplasia, diffuse infiltration of eosinophils in lymphoid follicles, and several eosinophilic microabscesses. After a comprehensive review, the final diagnosis for this patient was KD and atopic dermatitis comorbidity.

Conclusion: KD is not limited to males, as this report demonstrates. The histopathological examination plays an important role in the diagnosis of KD. This case illustrates the characteristic description of KD and highlights the need for awareness of this rare disease in Asian women.
WAC23-0084
Long-term hereditary angioedema prophylaxis with berotralstat is well tolerated and effective: analysis for the APeX-S study

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Background: Berotralstat is a first-line once-daily oral prophylaxis for hereditary angioedema (HAE). Here we report the final long-term safety and effectiveness of berotralstat over 96 weeks for patients enrolled in APeX-S.

Methods: APeX-S was an open-label, international study (NCT03472040). Eligible patients with HAE type 1 or 2 were allocated to berotralstat 110 mg or 150 mg once-daily until superior efficacy at 150 mg was demonstrated in APeX-2 (NCT03485911). The primary study objective was safety and tolerability. Adjusted HAE attack rates were evaluated as a secondary objective.

Result: Overall, 287 patients received berotralstat 150 mg for the study duration and 100 patients initially received 110 mg. Treatment-emergent adverse events (TEAEs) occurred in 334/387 (86.3%) patients. The most common TEAEs were nasopharyngitis (23.8%), headache (14.7%), and diarrhea (14.5%). Drug-related TEAEs occurred in 177/387 (45.7%) patients. Four (1.0%) patients experienced a serious drug-related TEAE. Discontinuations due to TEAEs occurred in 36/387 (9.3%) patients. In patients who received 150 mg berotralstat throughout, mean (SEM) adjusted HAE attack rates declined from 1.1 (0.10) at Month 1 to 0.9 (0.10) at Month 6, 0.7 (0.08) at Month 12, and 0.8 (0.11) at Month 24 with a median attack rate of 0.0 attacks/month observed in 20 of the 24 months.

Conclusion: Berotralstat was generally well tolerated. Patients experienced a sustained reduction in attacks throughout treatment. These final results from APeX-S support the long-term safety and efficacy of oral berotralstat, making it an effective and convenient prophylactic HAE therapy option.
WAC23-0098
Specific IgG4 antibody as a marker of immune tolerance to IgE mediated response in allergic children

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Background: Recently, the possibility of specific IgG4 (sIgG4) as an indicator of immune tolerance has emerged. There are few studies sIgG4 in children, so we tried to evaluate the usefulness of sIgG4 tests.

Methods: The subjects were 415 children who performed sIgE and sIgG4 tests for suspected allergic diseases. sIgE and specific IgG4 of casein, egg white, peanut, D. farinae, dog dander and birch were measured.

Result: Total 415 patients (6.44 ± 4.46 years, male: 61%, female: 39%) involved. The sIgG4/E ratio was significantly increased in the patients without symptoms to the inhalant allergens (D. farinae: P=0.031, dog dander: P<0.001, birch: P=0.014). In food allergens, casein (sIgE: P=0.031, sIgG4: P<0.001, sIgG4/sIgE ratio: P<0.001) and egg white (sIgE: P<0.001, sIgG4: P<0.001, sIgG4/sIgE ratio: P<0.001) showed a significant difference. But no significant results were seen in peanut.

Conclusion: The clinical value of sIgG4 level alone in inhaled allergens is low, and the sIgG4/sIgE ratio may have potential as an indicator of immune tolerance. In food allergens, the sIgG4 and sIgG4/sIgE ratios have showed potential for use as indicators of immune tolerance for egg white and casein, but additional studies are needed.
WAC23-0116
Comparative study of clinical characteristics and treatment outcomes: HES, EGPA and HES/EGPA overlap

Professor Sae-Hoon Kim¹, Professor Yoon-Seok Chang¹, Professor Sae-Hoon Kim¹, Dr. Ji-ung Jeong², Dr. Yu Kyong Hwang³, Dr. Joonwoo Bahn⁴, Dr. Jeong-Eun Yun⁵, Professor Suh-Young Lee⁶, Professor Hye-Ryun Kang⁶

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Background: Hypereosinophilic syndromes (HES) are a collection of rare disorders characterized by increased number of eosinophils in the peripheral blood and damage to multiple organs. Eosinophilic granulomatosis with polyangiitis (EGPA) encompasses both HES and vasculitis, making differentiation between HES and EGPA complex in actual clinical settings. We aimed to investigate the differences in clinical characteristics and treatment results among HES, EGPA and HES/EGPA overlap.

Methods: We retrospectively analyzed electronic medical records from two institutions for patients diagnosed with HES, EGPA, and their overlap from January 2011 to December 2020. The criteria for HES included persistent blood hypereosinophilia, organ damage or tissue hypereosinophilia, and exclusion of secondary causes. EGPA was diagnosed based on 4 or more out of the 6 ACR criteria. HES/EGPA overlap was diagnosed if both criteria were fulfilled.

Result: A total of 186 patients (127 HES, 40 EGPA, 19 overlap) were included in the analysis. The overlap group showed significantly higher baseline ESR and CRP. The absence of allergic disease comorbidities was common in HES, while asthma was frequent in EGPA and the overlap group. Liver involvement was more common in HES, whereas peripheral nerve involvement was frequent in EGPA. Involvement of internal organ other than skin in initial presentation was associated with higher proportion of non-responders to treatment in 1-month and 12-month after treatment.

Conclusion: Several different features were found in terms of initial clinical and laboratory findings and treatment outcomes among HES, EGPA and HES/EGPA overlap. Further studies with prospective design are warranted to confirm in the future.
POSTER PRESENTATION

PDS2: Dec 1, 2023
(15.30-16.00)
Differential allergic responses to different edible shrimp may be explained by contrasting allergen profiles

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Background: Background: Shrimp is the leading food causing anaphylaxis. Some patients only react to selected seawater (SW) or freshwater (FW) edible shrimp, the reasons of which are currently unclear. This study correlated allergen profiles of SW and FW shrimp with challenge-confirmed shrimp allergy.

Methods: Methods: This study characterized allergens of two SW (Penaeus monodon and Litopenaeus vannamei) and two FW (Macrobrachium rosenbergii and M. nipponense) shrimp. The identity of IgE-reactive allergens in these shrimps was identified by mass spectrometry. Clinical SW and FW shrimp allergy was ascertained by double-blind, placebo-controlled food challenge (DBPCFC) with P. monodon (tiger prawn) and M. rosenbergii (big head shrimp) respectively.

Result: Both tropomyosin and myosin heavy chain were cross-reactive allergens across all tested shrimps, and >70% of shrimp-allergic subjects reacted to tropomyosin. Myosin heavy chain only contributed to <20% sensitization. Hemocyanin was the common allergen only in P. monodon and M. rosenbergii. Thirty-two subjects aged 30.8±8.7 years underwent DBPCFC to both edible shrimps. Five (16%) and two (6%) of them reacted to SW and FW shrimp respectively. Only one subject was allergic to both SW and FW shrimps. Because of small sample size, we could not find any significant
relationship between allergen sensitizations and challenge-confirmed allergy to SW and FW shrimps.

**Conclusion:** Tropomyosin is the major cross-reactive allergen across our edible shrimps. Differences in allergen structure and sequences from SW and FW shrimps may explain the discrepancy in clinical shrimp allergy. (funded by Health and Medical Research Fund [reference 08191436] and RGC Research Impact Fund [reference R4035-19])
Eight-year follow-up of hen’s egg oral immunotherapy for patients with a low induction threshold

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Background: We previously reported that low-dose egg oral immunotherapy (OIT) for 1 year with 194 mg of egg protein resulted in 33% of children to pass a 3100-mg oral food challenge (OFC). We aimed to evaluate the efficacy and safety of egg OIT over an 8-year period.

Methods: Twenty-one patients who tested positive in a 194-mg OFC from 2012 to 2014 were enrolled and were administered low-dose OIT with scrambled eggs. The subjects who passed the OFC after eggs were completely eliminated for 2 weeks were termed as showing short-term unresponsiveness (STU). Those who achieved STU for a 3100-mg dose at 1 year continued to consume the 3100 mg dose twice weekly. A maintenance dose was continued in other patients or their intake was gradually increased. Two years later, STU for a minimum dose of 3100 mg was confirmed repeatedly by performing OFCs.

Result: STU rates for a dose of 3100 mg at 4, 6, and 8 years of follow-up were 49%, 78%, and 89%, respectively. Over the 8-year study period, the rates of moderate and severe adverse reactions per intake were 0.5% and 0.006%, respectively. In one case, an intramuscular adrenaline injection was required to manage the patient’s condition. Specific immunoglobulin E (sIgE) levels for egg white and ovomucoid significantly decreased from 36 and 19 kUA/L at 1 year to 5 and 2 kUA/L at 8 years, respectively (P < 0.001 and P = 0.002). Over the 8-year study period, the frequency of gastrointestinal symptoms per intake in the first month was significantly higher in the patients who had not achieved STU for the 3100-mg dose than in those who had (22.9% vs. 2%; P <
Moreover, 77.2% (14/18) of the patients in whom the said frequency was less than 10% (n = 18) achieved STU for the 3100-mg dose, whereas 0% (0/3) of patients in whom this frequency was more than 10% (n = 3) achieved STU for the 3100-mg dose (P = 0.026).

**Conclusion:** The rates of achievement of STU increased over time. Long-term OIT involving a protocol of starting with induction at a low dose and then gradually increasing the ingestion dose was safe and effective for managing severe egg allergy with a low induction threshold. Frequent gastrointestinal symptoms during the first month of OIT may predict a poor long-term prognosis.
WAC23-0255
Characteristics of food protein–induced enterocolitis syndrome with metabolic acidosis: Case series

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¹MD, The national child carecenter and depelopment
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Background: Food protein–induced enterocolitis syndrome (FPIES) is a non–IgE-mediated food hypersensitivity featured by gastrointestinal symptoms. Sometimes symptoms could be severe accompanied by acidosis, but the characteristics of patients are unclear. We investigated the characteristics of FPIES patients with metabolic acidosis.

Case study: Method We searched the medical records at our institute from March 2002 to May 2022. We examined the infants who fulfilled FPIES diagnostic criteria (vomiting within 1 to 4 hours after the challenge of culprit foods) and blood gas analysis. We compared the FPIES with metabolic acidosis (MA) and FPIES without metabolic acidosis (wo-MA). Results All FPIES were severe. We included 7 in the MA group (7 cow’s milk) and 13 (7 cow’s milk and 6 solids foods) in wo-MA. Acidosis was not accompanied by anion gap opening. All infants in MA had abdominal distention, whereas none in wo-MA. MA patients include 6 chronic FPIES, 1 acute FPIES. In the subgroup analysis of cow’s milk, MA had more girls (71% vs 29%). Age at onset was similar in both groups (median 9 days after birth vs 9 days). MA had shorter gestational weeks (median 36 vs 39) and lower birth weight (median 2,558 g vs 2,778 g)

Conclusion: This first case series study investigating FPIES patients with metabolic acidosis suggests: 1) Abdominal distention and acidosis without anion gap opening could be a distinctive feature of FPIES with metabolic acidosis, suggesting loss of HCO3 and fluid into the lumen of the intestinal tract. 2) cow’s milk, prematurity, and sex could be risk factors
WAC23-0257
Clues in color: an unusual cause of recurrent angioedema

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¹Doctor, National University Health Systems

**Background:** Rationale: Hypersensitivity to excipients and additives is uncommon, but is increasingly relevant in today’s era of food globalization. We report a case of an adult female with recurrent, unexplained angioedema whose eventual diagnosis was carmine (cochineal) hypersensitivity.

**Methods:** A 36-year old female with allergic rhinitis and house-dust mite sensitization was evaluated for 3 years of recurrent isolated lip angioedema. These were associated with apparently inconsistent food exposures, including sponge cake and airplane meals. Ingredient lists were not available for review. The latest episodes were associated with the intake of rose (red), blackcurrant (purple), raspberry (pink) and gold-flavored Laduree macarons and argan oil supplement. She was able to take Laduree macarons of other colors. Major food allergens are tolerated. Serum C4 levels were normal. Skin prick testing to common foods and commercial food coloring extract (red PF20/E129 – azo dye) was negative. Prick-prick test to Laduree macarons was positive to red, purple, pink and gold macarons, but negative to yellow and green macarons, consistent with the submitted history. Review of the ingredients eventually provided by the manufacturer (Laduree) showed carmine (E120) to be the only ingredient present exclusively in implicated macarons. It was also present in the argan oil supplement. Serum-IgE to carmine was positive. The patient declined oral food challenge.

**Conclusion:** Idiopathic angioedema is a diagnosis of exclusion. A detailed food history and ingredient list should be obtained where possible; prick-prick testing remains an important tool, especially if ingredients are not immediately verifiable. Skin testing reagents should be directed accordingly.
**WAC23-0260**  
**Effects of Different Cooking Treatments on Allergenicity of Tree Nuts**

Dr. Oi Man Chan¹, Dr. Oi Man Chan¹, Assistant Professor Sze Yin Leung², Professor Ting Fan LEUNG³, Dr. Noelle Ngai⁴

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²Assistant Professor, The Chinese University of Hong Kong  
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**Background:** Tree nuts are one of the most common food allergens. Tree nut allergies seem to be increasing epidemiologically over the past years. We know that the allergenicity of food proteins can be altered by different types of processing. In Chinese culture, tree nuts, such as cashew, are typically consumed after boiling in soup instead of being consumed roasted and salted as in Western countries. We hypothesize that cooking treatments result in improved tolerance of cashew in allergic patients. Our study aims to analyze the impact of different cooking methods on the allergenicity of cashew.

**Methods:** Cashews were subjected to five cooking methods including boiling, roasting, stir-frying, deep-frying, and air-frying at different temperatures and for variable durations. The characterization of the electrophoretic profile of the soluble protein extracts from the treated versus untreated cashews was compared using SDS-PAGE (sodium dodecyl sulfate-polyacrylamide gel electrophoresis).

**Result:** The results showed that the treatments of boiling for 120 minutes, baking at 180°C for over 20 minutes and air-frying at 180 °C for over 10 minutes had significant effects demonstrating less distinctive strained bands in the SDS-PAGE profile. Cashews subjected to higher temperatures and longer durations showed increased protein fragmentation.

**Conclusion:** Different cooking treatments of cashews exhibited varying effects on the protein profile. These methods may be useful as processing techniques to reduce immunoglobulin E binding to food allergens.
Temporal trends of epidemiology and clinical spectrum of parent-reported adverse food reactions (AFR) in Hong Kong Chinese preschoolers

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Background: Compared to the West, information on the temporal trends of food allergy is lacking in Asia. This study examines the prevalence and clinical characteristics of AFR in Chinese children in Hong Kong across three time points: 2007-2008, 2013-2014 and 2020-2021.

Methods: Children aged 2-7 years old were recruited through local kindergartens and the clinical spectrum and AFR presence were recorded. Subjects’ parents completed a self-administered questionnaire, adapted and validated based on the International Study of Asthma and Allergy in Childhood.

Result: Questionnaires were analyzable for 3659 of 3827 children from 21 schools (2007-2008), 3603 of 3687 children from 17 schools (2013-2014), and 4275 of 4434 children from 32 schools (2020-2021). There was a higher prevalence of parent-reported AFR in 2020-2021 (8.5%) and 2013-2014 (9.5%) compared to 2007-2008 (6.1%) (p<0.001), with no significant differences seen between 2013-2021. This pattern was also observed in parent-reported, doctor-diagnosed AFR (3.8% vs. 3.8% vs. 2.6%; p<0.001). Crustacean shellfish, egg and peanut were consistent leading allergens, with skin reactions being the most common AFR. Asthma prevalence decreased from 2007 to 2021 (5.1% vs. 4.6% vs. 2.1%; p<0.001), while eczema ever increased overall (31.8% vs. 40.5% vs. 34.2%; p<0.001). The increase then decrease in eczema paralleled the changes seen in food avoidance (11.2% vs. 12.8% vs. 10.9%; p<0.05).

Conclusion: This study demonstrated an overall increase in AFR and eczema prevalence, with shellfish remaining the top allergen trigger from 2007-2021. Despite an average of 11% reported food avoidance, only 3% had doctor-diagnosed AFR.
WAC23-0273
EDIBLE INSECT ALLERGY IN CHILDREN AND ADOLESCENTS: ALLERGIC
REACTIONS AND CROSSREACTIVITY AMONG EDIBLE INSECT ALLERGENS
AND OTHER ARTHROPODS

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¹¹Pediatric Allergy and Immunology, Medical Education Center, Ratchaburi Hospital
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Background: Edible insects have become increasingly interesting as alternative protein
sources for human food. There are many reports about allergic reactions after insect
consumption. We studied the cross-reactivity of house dust mite, cockroach,
crustaceans (shrimp, crab) to different edible insects in children and adolescents.

Methods: A cross-sectional descriptive study collected data from pediatric patients at
Ratchaburi hospital, during 1st January 2016 to 31st May 2021, that reported having
symptoms after insect ingestions. The patients had subsequently received a skin prick
test to house dust mite and cockroach, prick to prick test to crustaceans and different
edible insects.

Result: A total of 45 patients that reported having symptoms after insect ingestions
were male and female 66.7% and 33.3% respectively. Median and range of age onset
are 8 and 4-18 years. Allergic history were reported in 32 (71.1%) patients, 11.1%
having allergic rhinitis and twenty-eight (62.2%) patients reported shellfish allergy.
Anaphylaxis was found in 35 (77.7%) patients and only one patient reported
anaphylactic shock. Of the 19 patients, who had received a skin test, results indicated
that all of them had a positive prick to prick test to silkworm pupae, cricket,
grasshopper and a positive skin prick test to house dust mite and cockroach. Fourteen
(73.7%) and nine (47.4%) patients had a positive test to shrimp and crab, respectively.

Conclusion: Allergens from edible insects can cross-react with crustaceans (e.g.,
shrimps, crabs) but also with inhalant allergens like house dust mite and cockroach.
Feasibility and safety of the early introduction of allergenic foods in infants with eczema: a real-world observational study

Dr. Daisuke Harama¹, Dr. Daisuke Harama¹, Dr. Mayako Saito-Abe¹, Dr. Sayaka Hamaguchi³, Dr. Kiwako Yamamoto-Hanada¹, Dr. Tatsuki Fukuie¹, Dr. Yukihiro Ohya¹

¹Pediatric allergy, Allergy Center, National Center for Child Health and Development, Tokyo, Japan.

Background: Despite the rapidly increasing incidence of tree nut allergy among Japanese children, evidence regarding the efficacy and safety of the early introduction of allergenic foods to prevent this allergy is lacking. This study aimed to clarify the feasibility and safety of the early introduction of tree nuts to Japanese infants in a real-world setting.

Methods: We conducted a single-center, retrospective, observational study. We followed up six-month-old children diagnosed with atopic dermatitis (AD) until they were two years old. In addition to administering well-controlled AD treatment, physicians instructed parents to initiate the early introduction of allergenic foods, including hen’s eggs, peanuts, and nuts, when the infants started weaning foods and provide peanuts and tree nuts in the form of smooth paste or powder. The primary outcome was the proportions of daily intake of hen’s egg, peanuts, walnuts, and cashews at two years of age. Adverse events related to early food introduction were also evaluated.

Result: The study included 34 infants with AD. The proportions of daily intake of hen’s egg, peanuts, walnuts, and cashews at two years of age were 100%, 64.7%, 61.8%, and 14.7%, respectively. None of the infants experienced adverse events related to the early introduction of allergenic food, including allergic reaction and choking.

Conclusion: In infants with AD, allergenic foods could be introduced early without adverse events. Hen’s egg could be easily introduced early in infancy, whereas the early introduction of peanuts and tree nuts was more challenging in a real-world practice.
Background: The cell types involved in the pathogenesis and phenotypes in each allergic patient are not well classified. Recent studies have revealed some specific CD4+ T cells were mechanistically changed within patients undergoing peanuts oral immunotherapy. The aim of this study is to clarify the relationship between the phenotype of peripheral antigen specific CD4+T cells and the endotypes of children with food allergies in Japan.

Methods: We analyzed blood samples from patients under 15 years old with food allergies including hen’s egg, cow’s milk wheat and peanuts. We stimulated PBMC with sensitized antigen and check CD154 and CD137 positive cells combined with several distinctive surface markers in CD4+ T cells by flow cytometry (Activation-induced marker assay: AIM assay). The clinical data such as threshold of food and specific IgE were collected.

Result: Antigen-specific CD154+ and CD137+ CD4+T cells were frequently observed in peripheral blood with hen’s egg, cow’s milk, and wheat allergies as well as the sample from peanuts allergy. The cell surface markers, ST2, CCR6 and CRTH2, in antigen-specific cells were upregulated more in severe allergic patients than ones can intake more amount of sensitized food.

Conclusion: AIM assay can also detect the antigen-specific CD4+T cells in common food allergies in Japan nuother than peanut allergy. AIM assay could be potential clinical test to define the phenotypes of the patients with food allergy in Japan.
Intraspecies variations in the allergen abundance in black tiger shrimp (Penaeus monodon) from different Asia Pacific origins may impact food safety assessment

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**Background:** Shellfish allergy affects over 2% of the world’s population, making the detection of allergens critical for food safety. Most crustacean allergen test kits target the allergen tropomyosin, which may be affected by origin-dependent protein composition. This study determined if the geographic location of capture, or aquaculture, influenced the allergenic protein profile in black tiger shrimp (Penaeus monodon), one of the most farmed and consumed shrimp species worldwide.

**Methods:** Protein composition was analysed in shrimp from nine different locations in the Asia-Pacific by sodium dodecylsulfate polyacrylamide gel electrophoresis (SDS-PAGE), immunoblotting with allergen-specific antibodies followed by quantitative analysis, and advanced mass spectrometry to measure abundance of allergens in each shrimp samples.
**Result:** Nine of the eleven known shrimp allergens were detected, however with considerable differences between locations. Sarcoplasmic calcium-binding protein, myosin light-chain and tropomyosin were the most abundant allergens in all locations. Hemocyanin-specific antibodies could identify up to six different isoforms, with the strongest presence and diversity seen in Indonesian shrimp. Tropomyosin was 13 times more abundant in farmed shrimps from India compared to Australia.

**Conclusion:** The findings from this study suggest that environmental conditions can significantly affect allergen abundance and thus, shrimp origin might directly impact the readout of commercial crustacean detection kits, most of which target tropomyosin, and should be considered in food safety assessments.
Allergenicity of redclaw crayfish (Cherax quadricarinatus) and the effect of tissue type on allergen abundance

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Background: Shellfish allergy affects around 2% of the global population and defined as a type-1 hypersensitivity resulting from exposure to crustacean/molluscan proteins, which are typically muscle proteins. It is conceivable that shellfish tissues vary in allergenicity depending on tissue type. Redclaw crayfish (Cherax quadricarinatus) is a species farmed in northeastern Australia, and are a globally introduced species. Despite this, no redclaw allergens have been officially characterised. This study aimed to characterise redclaw allergens, determine allergen distribution among raw and heated tissues, and identify the potential of redclaw allergens to cross-react to prawn-allergic patients.

Methods: Raw and cooked extracts were prepared from claw, tail, and cephalothorax (head). SDS-PAGE was performed to visualise proteins, followed by immunoblotting to determine allergen-specific antibody reactivity to sarcoplasmic calciumbinding protein and hemocyanin. Liquid chromatography-mass spectrometry (LC/MS) characterised proteins and determine abundance within extracts. Individual and pooled sera from prawn-allergic patients were used to determine IgE-binding to redclaw proteins.
**Result:** Although known allergens were found in all tissues, differences were found in distribution. Proportion of allergens increased in cooked tissues. Previously described heat-stable allergens were found to be partially heat-labile. Immunoblotting indicated that prawn-allergic patients cross-react to redclaw allergens. IgE-binding bands analysed by LC/MS identified up to 11 known shellfish allergens.

**Conclusion:** Significant differences were found in proteome content between tissues and heat treatments. Prawn-allergic patients, and likely shellfish-allergic patients, are cross-reactive to redclaw proteins. The findings of this study provide fundamental knowledge into the diagnostic and therapeutic field of shellfish allergy.
WAC23-0134
Fruit and vegetable induced anaphylaxis in Korean children and adults: 10-year retrospective study in a tertiary hospital

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Background: Fruit and vegetable allergies seem to be increasing but related studies are lacking so far. We aimed to identify the common causes of anaphylaxis caused by fruits and vegetables in Korean children and adults.

Methods: Medical records of patients diagnosed with fruit or vegetable allergy between March 2008 and February 2018 in Ajou University Hospital were reviewed retrospectively.

Result: Among the 1136 (1651 cases) patients with plant food allergy, 255 were allergic to fruits and 109 were allergic to vegetables. The proportion of anaphylaxis among fruit allergy was 13.8% and the eight major culprit fruits of anaphylaxis were peach (22.8%), apple (15.8%), kiwi (15.8%), mango (10.5%), plum (5.3%), lychee (3.5%), Japanese apricot (3.5%), and grape (3.5%). In analysis by age groups, the major causes of fruit-induced anaphylaxis were peach (28.6%), kiwi (28.6%), and apple (14.3%) in children, and mango (17.2%), peach (17.2%), and apple (17.2%) in adults. Among each fruit allergy, the proportion of anaphylaxis was highest in Japanese apricot (100%), followed by lychee (66.7%), grape (40.0%), and mango (31.6%). In vegetable allergy, anaphylaxis was noticed in 24.6% and the seven major culprit vegetables were potato (13.8%), tomato (13.8%), ginseng (10.3%), Korean thistle (6.9%), carrot (6.9%), cucumber (6.9%), and pumpkin (6.9%). Among each vegetable allergy, the proportion of anaphylaxis was highest in Korean thistle (100%), followed by ginseng (50.0%), carrot (50.0%), cucumber (50.0%), and potato (40.0%).

Conclusion: The proportion of anaphylaxis among fruit and vegetable allergies were 13.8% and 24.6%, respectively. The most common causes of fruit-induced anaphylaxis were peach in children and mango in adults.
Hiding in plain sight; highlighting the need for clinician awareness

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**Background:** Use of alternative grain flours in trending natural food diets is increasing, possibly resulting in increasing incidence of rare food allergies such as to buckwheat. We describe one such case here.

**Case study:** A 46-year-old female was referred to the Allergy Department at Guy’s hospital following 4 reactions in the past 5 years. Within an hour of consuming various meals, she reported breathlessness, wheezing, throat tightness, hives and gastrointestinal symptoms. The last reaction occurred after consuming crepes with cheese and ham; the patient stated she had subsequently tolerated the individual ingredients. Skin prick test to peach reagent and IgE to omega-5 gliadin, peach Prup3 and lupin seed were negative. During her follow-up, the patient reported recurrence of symptoms to the same crepe. She again insisted the ingredients were common to her; only on the clinician’s further request she presented the ingredients’ list which included buckwheat. A positive IgE to buckwheat and Fag e 2 on ISAC confirmed buckwheat allergy with co-sensitisation to grass pollen. She has since been avoiding buckwheat with no further reactions.

**Conclusion:** The common buckwheat (Fagopyrum esculentum) is a non-cereal grain crop. The seed gives a dark flour used in a wide variety of cuisines, such as Asian, Russian and European. It is a rare allergen in Europe, and North America, but common in Asia. Fag e1, Fag e2 and Fag e3 are considered major allergens. This case raises awareness of this rare allergen hidden in common foods that may be overlooked by both the patient and the clinician.
Benefits of mobile messenger application in caregivers of food allergy children

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Background: Unintentional exposure is common in children with food allergies.

Methods: Caregivers of children with confirmed immediate reactions to food were enrolled to use the application, called "Kinchew" for one month. Kinchew provides the detail of food allergens after typing the name of specific food in the chat box. Then, the app provides the product image and detail of food allergens. Kinchew also has a menu for recording food diaries and videos on managing food allergies. Kinchew users were asked to assess their confidence in dealing with food allergies assessed by the questionnaire using 5 points Likert scale. The average number of unintentional food exposure per month was compared before and after using Kinchew.

Result: Seventy caregivers were enrolled. Wheat was the most common causative food in 67% of the participants, followed by egg white (49%). All participants used Kinchew with a total use of 1,754 times, classified as food items searching 1080 times (62%) and recorded their food diary 674 times (38%). The median of unintentional exposure significantly decreased from 3 (2-4) to 1 (0-2) events; p< 0.001. The user's confidence in choosing food improved significantly compared to the baseline score. In the subgroup analysis of the type of causative food, a significant improvement in confidence in food choosing was demonstrated in wheat and multiple food allergy groups.

Conclusion: Well-designed food allergy mobile applications could improve caregivers' confidence in dealing with food allergies and reduce unintentional food exposure.
Cord blood zonulin levels are associated with high-level sensitization to food allergen and food allergy development: results from CHIBA study

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Background: Epithelial barrier impairment is essential in allergen sensitization. Zonulin, an epithelial tight junction regulator, plays an important role in regulating epithelial barrier function in the intestinal tract, and has been reported to be associated with chronic inflammatory diseases. But whether intestinal barrier function at birth is related to the subsequent development of sensitization and allergic diseases remains unclear.

Methods: Data on 205 participants from the whole participants of the Chiba High-risk Birth Cohort for Allergy (CHIBA) study, including 285 dyads of pregnant women and their children who had a family history of allergy, were analyzed. Serum zonulin protein was measured by competitive ELISA using ImmunoDiagnostik's IDK\textsuperscript{\textregistered} Zonulin ELISA kit. Allergen sensitization was defined as egg white (EW)-specific IgE class $\geq$ 2. Those with class $\geq$ 3 were considered high-level sensitization. Food allergy (FA) was diagnosed based on the questionnaire responses, “history of immediate FA symptoms associated with hen’s egg ingestion.” We evaluate whether cord blood zonulin levels (cZonulin), a surrogate marker of intestinal barrier function at birth, were associated with EW sensitization and FA development.

Result: The median cZonulin (interquartile range) (ng/mL) were 8.7 (6.7–11.8). Although cZonulin was not associated with EW sensitization, it was significantly associated with high-level sensitization to EW (n=32, $P=0.011$) and FA development (n=12, $P=0.046$). In a multivariate analysis, both breastfeeding and cZonulin were risk factors for high-level sensitization of EW (odds ratio 1.08 [95\% confidence interval: 1.01–1.16] for cZonulin).

Conclusion: CZonulin were significantly higher in groups with high-level sensitization to EW and FA development.
Egg white-specific IgE and ovomucoid-specific IgE values for the diagnosis of immediate-type egg allergy in infants and young children in Korea

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Background: We aimed to determine the egg-specific IgE value that can be used to easily and accurately diagnose egg allergy in Korean infants and young children and evaluate its clinical utility.

Methods: Among patients who were younger than or 36 months of age who visited the allergy clinics of 17 hospitals nationwide because of suspected food allergies, we retrospectively collected data on food intake methods and egg-specific IgE
concentrations for those who were confirmed to be symptomatic on ingesting eggs during an oral provocation test or history taking.

**Result:** Data were collected from 552 subjects, of whom 448 met the age criteria and for whom both allergy symptoms and blood-specific IgE concentrations were confirmed. Three hundred and twenty-two subjects with confirmed egg allergy were categorized as the egg allergy group and 126 subjects without confirmed egg allergy were categorized as the control group. Specific IgE concentrations for egg white, ovomucoid, egg yolk, and ovalbumin were all significantly higher in the egg allergy group. Eighty-three patients (27.5%) in the egg allergy group developed anaphylaxis. Receiver operating characteristic (ROC) analysis revealed that the optimal cutoff egg white-specific and ovomucoid-specific IgE concentrations for the diagnosis of egg allergy were 4.20 kUA/L (sensitivity, 70%; specificity, 60%) and 0.52 kUA/L (sensitivity, 82%; specificity, 71%), respectively. The ROC curves for egg white and ovomucoid showed significant differences with the areas under the curve being 0.716 and 0.791, respectively (P = 0.0067).

**Conclusion:** We determined the optimal egg white-specific and ovomucoid-specific IgE concentrations for the diagnosis of egg allergy in Korean infants and young children and expect to use them for the diagnosis and treatment of egg allergy in clinical settings.
WAC23-0193
Allergic reaction to wheat appears later than milk during oral food challenge Late allergic reaction to wheat OFC

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Background: Allergic reactions to milk appear sooner than allergic reactions to hen’s eggs, irrespective of the total dose of the OFCs and type of matrices. The median times for the first symptom occurrence were 20-30 min with milk and 50-60 min with eggs. However, allergic reactions due to wheat have not yet been fully investigated.

Methods: This study retrospectively collected data from oral food challenge tests for milk and wheat conducted at Sagamihara Hospital and Sendai medical center from 2009 to 2023. The time from the start of the oral food challenge test to the onset of symptoms was compared in children with cow’s milk and wheat allergies.

Result: Twenty-five, and 13 children reacted to single-dose oral food challenges with milk product equivalent to 25 mL of raw cow’s milk, or 15 g of udon noodles. The median ages of patients with a positive challenge were 1.4, and 2.8 years for milk, and wheat, respectively. The median times for the first symptom occurrence were 20 min, and 53 min, respectively (p = 0.006).

Conclusion: This multicenter study firstly examined the time of symptom appearance during single-medium-dose milk and wheat challenges. Allergic reactions to wheat appear later than milk during oral food challenge. The dosing interval should be longer than 60 minutes for multi-administration OFC for wheat. Our findings can help improve the safety of OFCs.
WAC23-0199
PATIENTS WITH LTP SYNDROME: SENSITIZATION PROFILE AND SEVERITY OF REACTIONS

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Background: The aim of this study was to analyze the sensitization and severity of reactions of patients with LTP syndrome

Methods: Our study included 337 patients with clinical peach allergy, during the period 2014-2022. All patients reported at least one episode after eating peach, all had (+) skin prick test to commercial peach extract (SPT-Letti) and specific IgE (CAP/FEIA) on F95 and Pru p 3. Patients also underwent IgE to aeroallergens (plantain, artemisia, ambrosia). Two groups were formed:(a) Monosensitized: (+) SPT to peach, to specific IgE: F95 and Prup3 >0.7 KU/L and (-) SPT to the aeroallergens (b) Multisensitized: (+) SPT to peach and specific IgE:F95 and Prup3 >0.7 KU/L and (+) SPT to at least 1 of the aeroallergens and specific IgE to the corresponding aeroallergens t11, w6, w1 >0.7 KU/L

Result: Of 337 patients, 232 (68.9%) were female with a median age of 34 years; of the 337, 48 (14.2%) were monosensitized and 289 (85.8%) were polysensitized. In the monosensitized group, 26 (54.8%) had oral allergy syndrome (OAS) or urticaria and 22 (45.2%) had anaphylaxis. Of the multisensitized, 47 (16.5%) had anaphylaxis, 242 (83.5%) had OAS or urticaria. We found that in mono sensitized patients the percentage of anaphylaxis was significantly higher compared to poly-sensitized patients (45.2% vs 16.5%-p<0.01)

Conclusion: The most significant difference between monosensitized patients to peach and poly-sensitized patients to peach and pollen (plantain, artemisia or ambrosia) is that poly-sensitization to pollen seems to reduce the severity of reactions, whereas patients with a monosensitization profile have more severe reactions.
WAC23-0201
Changes of IgE binding ability in various cooked egg white components using IgE-Immunoblot

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Background: The allergenicity of hen’s egg white (HEW) can altered by food processing such as cooking methods. This study aimed to evaluate changes in IgE binding ability in components of various cooked HEW in egg allergic children.

Methods: Sera were collected from 45 subjects divided into 3 groups based on the patterns of positivity of ovalbumin (OVA) and ovomucoid (OM) specific IgE (OVA+OM+, OVA+OM–, OVA–OM–). Scrambled, boiled, short-baked, long-baked and raw HEW crude extracts were prepared and used for IgE-Immunoblot experiment.

Result: In OVA+OM+ and OVA+OM– groups, the median concentration of EW-sIgEs were 10.5 and 10.6 kU/L, OVA-sIgEs were 7.46 and 8.71 kU/L, and OM-sIgEs were 5.71 and <0.1 kU/L, respectively. All three sIgE concentrations were <0.1 kU/L in the OVA–OM– group. In IgE-Immunoblot using OVA+OM+ pooled sera, the band corresponding to OT diminished after all kinds of cooking methods. The intensity of the band corresponding to OVA did not change after scrambling; however, decreased by boiling. In contrast, OM corresponding band was darker and wider after scrambling and boiling. The IgE binding ability to all components weakened in short-baked and remarkably diminished in long-baked EW. In the IgE-Immunoblot using OVA+OMpooled sera, the band corresponding to OVA was observed in raw and scrambled, whereas it nearly decreased in boiled and disappeared in baked EW. There was no visible binding band in the OVA–OM– group.

Conclusion: The IgE binding ability significantly decreased in components of short and long baked egg white.
Determinants of quality of life of fish-allergic children in Hong Kong

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Background: Fish is an important and common food allergen in Hong Kong. The aim of this project is to study how fish allergy affects the health-related quality of life of children.

Methods: Patients aged 8-12 years and 13-17 years with challenge-confirmed fish allergy completed the Food Allergy Quality of Life Questionnaire (FAQLQ)-child form and teenage forms, respectively. The questionnaires include questions on their daily experiences with allergy, and on an additional depression and anxiety scale.

Result: Twenty patients with a median age of 10.3 (IQR=5.3) years with fish allergy were recruited, of which 11 (55%) were male. Personal and family factors appeared to play a significant role in affecting their QoL and emotions. Female patients performed poorer in the depression questionnaire though compared to male, they were less worried about having serious accidental food-allergic reactions (P=.004). Patients’ worries and negative emotions were positively correlated with mothers’ education levels while being negatively correlated to that of fathers’. The fear of allergic conditions in food-allergic children was positively correlated with the number of foods avoided (P=.031). The number of hospital and clinic visits in the past 12 months were negatively correlated with their QoL. Lastly, it was found that egg allergy caused a more negative impact to QoL when compared to fish allergy.

Conclusion: Whilst fish allergy would make lives of patients more inconvenient, this could be improved by the support by their family and the medical sector.
WAC23-0205
Determining multiple IgE epitopes of the N-domain or the C-domain of ω5-gliadin as a major factor causing basophil degranulation

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Background: Omega 5 gliadin (ω5-gliadin) is the major allergen identified in Thai allergic individuals with wheat anaphylaxis (ANA) as well as wheat-dependent exercise-induced anaphylaxis (WDEIA). This preliminary study aimed to determine multiple IgE epitopes located in the N-domain (NOME) or C-domain (COME) of ω5-gliadin as a factor associating with clinical symptoms in these 2 patient groups.

Methods: Recombinant chimeric proteins coding modified multiple IgE epitopes in NOME (Trx-NOME) or COME (Trx-COME) were expressed in E.coli cells, purified before tested for degranulation of specific immunoglobulin E (sIgE) anchored rat basophil SX38 cells incubating with Trx-NOME or Trx-COME.

Result: The preliminary results showed the Trx-NOME induced more degranulated rat basophil SX38 cells than did the TrxCOME in all 4 WDEIA patients, whereas the TrxCOME induced more degranulated rat basophil SX38 cells than did the TrxNOME in one ANA patient.

Conclusion: These preliminary findings suggested a possible involvement of multi-epitopes in the N-domain of ω5-gliadin in WDEIA while the C-domain of ω5-gliadin may involve in wheat anaphylaxis. Further experiments would be needed to confirm these observations.
WAC23-0101
Clinical features and treatment outcomes of EGID subtypes: EoE vs. non-EoE

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Background: Eosinophilic gastrointestinal disorders (EGID) are increasingly recognized as immune-mediated chronic conditions that significantly affect a growing number of patients. However, the clinical and pathophysiologic differences between EGID subtypes that involve different segments of the GI tract as well as prognostic markers that can predict response to treatment, remain poorly understood.

Methods: We conducted a retrospective review of medical records from patients diagnosed with EGID involving the esophagus, stomach, small-bowel, colon between January 2011 and December 2020. Clinical features and disease progression were analyzed according to involved segments of the digestive tract. The baseline characteristics were categorized into two groups: EoE (eosinophilic esophagitis) and non-EoE (eosinophilic gastritis, enteritis, and colitis).

Result: Total of 125 patients with EGID (26 EoE, 99 non-EoE) were included in this study. Baseline ESR (mm/hr) was higher in non-EoE (8.0 vs 16.5, p=0.003). The presence of atopy and food allergy were similar between EoE and non-EoE. However, the prevalence of asthma was higher in EoE than non-EoE (36.0% vs 14.0%, P=0.019). There was no difference in treatment response between two groups and between single segment and multiple segment involvement. Baseline blood absolute eosinophil count were higher in non-CR than CR group both at 6 months and 24 months in whole EGID subjects.

Conclusion: Co-morbidity of asthma was prevalent in EoE compared to non-EOE. The initial peripheral blood eosinophil count was identified as a predictive marker related with treatment outcomes. To confirm these findings, prospective research involving a larger population is required in the future.
WAC23-0135
Diet restriction in eosinophilic esophagitis

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Background: We tested the ALEX2-macroarray (DASIT) in determining the allergy food profile of a patient with multiple eosinophilic organ involvement associated with severe anaphylaxis.

Case study: A 23-year-old man was admitted to our outpatient department for the worsening of dysphagia and food bolus episodes in the context of complex allergic manifestation: atopic dermatitis linked with sensitization to egg white proteins; allergic rhinitis with polysensitization to major proteins of dust mites, grasses, trees, animal dander; eosinophilic bronchial asthma and severe anaphylaxis following ingestion of nuts, fish, shrimps, molluscs. We performed a skin prick test and an extensive allergens determination with ALEX2 macroarray (DASIT); spirometry and FeNO for asthma monitoring, endoscopy and biopsies for gastrointestinal symptoms. Endoscopy showed a marked widespread eosinophilic infiltration associated with granulocytic abscesses which confirmed the hypothesis of eosinophilic esophagitis. Lung-function tests were normal. ALEX2 confirmed the positivity for food allergens including 2S storage proteins.

Conclusion: Topic budesonide and the association of topic budesonide and diet restriction, according to the ALEX2 macroarray (DASIT) results, which nevertheless did not improve the esophagitis symptoms. However we were able to reintroduce egg white without performing trigger tests.
Eosinophilic gastroenteritis in a very low birth weight infant: a diagnostic challenge and management approach

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Background: Eosinophilic gastroenteritis is diagnosed through gastrointestinal symptoms and eosinophil infiltration into the intestinal mucosa. However, in the case of premature infants, performing a lower gastrointestinal endoscopy can be challenging, makes the diagnosis difficult. As a result, eosinophilic gastroenteritis in premature infants is rarely reported.

Case study: A baby was delivered via cesarean section at 26 weeks and 2 days of gestation, with a weight of 1016 g. Tube feeding with artificial milk began on day 3. Abdominal distension and elevated CRP were observed on day 4. That same day, a lower gastrointestinal tract angiogram revealed a gastrointestinal tract perforation, and a stoma was placed in the ileocecal area. The infant was diagnosed with non-IgE-mediated gastrointestinal food allergies in the neonatal period and therapeutic milk was introduced. At 3 months of age, the infant continued to exhibit poor weight gain, refractory diarrhea, and hypoalbuminemia. Eosinophilic gastroenteritis was suspected due to scattered peripheral blood eosinophilia, but the infant's small size made endoscopy and biopsy difficult. The presence of numerous eosinophilic infiltration in the mucosa of the constructed stoma site was identified, which assisted us in treating the condition as eosinophilic gastroenteritis. Following the systemic administration of prednisolone, the diarrhea, poor weight gain, and hypoalbuminemia improved, allowing the patient to be discharged from the hospital.

Conclusion: This is the first reported case of eosinophilic gastroenteritis diagnosed pathologically in a surviving very low birth weight infant.
**WAC23-0220**

High rate of tolerance for quail’s egg in patients with hen’s egg food protein-induced enterocolitis syndrome

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**Background:** Patients with immediate-type food allergy are known to show clinical and serological cross-reactivity to hen’s egg (HE) and quail’s egg (QE). However, no study has as of yet investigated the relationship between clinical cross-reactivity to quail’s egg (QE) and hen’s egg in patients with hen’s egg-induced FPIES (HE-FPIES).

**Methods:** The present, monocentric, prospective study was performed at Tokyo Metropolitan Children’s Medical Center and included patients who tested positive on a hen’s egg yolk oral food challenge test (HEY-OFC) between March 2018 and December 2021. The patients' guardians gave their written informed consent for the test.

**Result:** In total, 12 patients underwent the QEY-OFC, and the results were negative in ten patients (83.3%). All the latter patients were able to tolerate quail’s egg white.

**Conclusion:** The present study demonstrated that most of the patients with HE-FPIES were able to tolerate QE.
Clinical characteristics of eosinophilic gastrointestinal disorders in children: a retrospective single center study

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Background: Eosinophilic gastrointestinal disorders (EGIDs) are rare and heterogeneous diseases characterized by gastrointestinal (GI) symptoms and eosinophilic infiltration within the GI tract. We aimed to investigate clinical characteristics of EGIDs in Korean children.

Methods: This retrospective study enrolled children aged 0 to 18 years who visited Samsung Medical Center between January 2018 and June 2023 with recurrent GI symptoms in patients with previous history of allergic disease or in association with specific food intake. Diagnosis criteria included eosinophil counts of ≥15/HPF in esophagus for eosinophilic esophagitis (EoE) and ≥ 30, 52, 100, 84, and 64 /HPF in stomach, duodenum, cecum/ascending, transverse/descending, and rectosigmoid colon, respectively, for eosinophilic gastroenteritis (EGE).

Result: Out of 44 patients, 12 (27.3%) were diagnosed with EGIDs. 6 had exclusive EoE, 3 exhibited exclusive EGE, and 3 presented EGE with esophageal involvement. The median age was 5.5 (1-15) years. Previous history of allergic diseases included food allergy and allergic rhinitis in 7 (58.3%) patients, respectively, and atopic dermatitis in 4. The most common GI symptom was abdominal pain (58.3%), followed by vomiting (33.3%), diarrhea (8.3%). Laboratory findings showed a median total IgE level of 667 kU/L (26.7-5001) and peripheral eosinophil percentage of 10.8% (2.6-25). Notably, 5 cases were diagnosed with EGID during oral immunotherapy.

Conclusion: EoE and EGE show a diverse presentation of symptoms and a history of allergic diseases. EGIDs should be considered as a potential differential diagnosis in children with recurrent GI symptoms in patients with previous history of allergic disease or in association with specific food intake.
CO-MORBIDITIES IN ALLERGIC DISEASE AND IMPACT ON CYTOKINES SYNTHESIS

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Background: Co-morbidities in patients with allergic rhinitis, atopic dermatitis, asthma may have an impact on the clinical status and severity of allergy symptoms, treatment efficacy of allergic patients and their immune system. This study investigates the impact on different co-morbidities including psoriasis and obesity and overweight status, and diabetes on synthesis of IgE-regulatory and pro-inflammatory cytokines.

Methods: Prevalence of co-morbidities (psoriasis, obesity and overweight, diabetes) in 1550 allergic patients (mainly allergic rhinitis, atopic dermatitis and asthma) were investigated by analysis of their histories. Assessment of concentration of IgE regulatory and pro-inflammatory cytokines (IL-4, IL-10, IL-6, IL-8, IFNγ, IL-17, L-18 and TNFa) in sera of allergy patients with psoriasis and weight disorders/diabetes (n=105) and patients without these co-morbidities (n=86) were assayed by ELISA.

Result: Serum levels of pro-inflammatory cytokines in most patients (~80%) with concomitant PS were greater than in allergic patients without psoriasis. The greatest increases occurred concentrations of IL-6, IL-8, IFNγ and IL-17 while concentrations of IL-4 and IL-10 demonstrated only low increases. In allergic patients being overweight, obese and with diabetes, similar increases in pro-inflammatory cytokines occurred and increases of IL-4, IFNγ by 1.5 to 2.8 fold (p<0.05) were seen in comparison to patients without co-morbidities.

Conclusion: There is a high impact of co-morbidities (psoriasis, obesity and overweight, diabetes) on cytokine synthesis in patients with allergies with these disorders playing a negative role on severity of allergy symptoms.
The prevalence of sensitization to the most common food allergens and their components among children in Lithuania

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Background: The prevalence of food allergies, especially in children, has become an important issue worldwide. Epidemiological studies reporting the prevalence of sensitization to common food allergens obtained by molecular diagnostic methods are still lacking in Lithuania.

Methods: A retrospective descriptive analysis of data from 310 children under 18 y/o was performed. The patients were divided into group by gender (girls: 138 (44,5%) and boys: 172 (55,5%)). Molecular allergology testing was performed with Allergy Explorer (AEX2) assay – a diagnostic tool containing 152 whole extracts and recombinant food allergens. Statistical analysis was performed using IBM SPSS Statistics 28.0.

Result: 227 (73.2%) children were sensitized to at least one allergen. 103 (74.6%) girls and 124 (72.0%) boys were sensitized to at least one allergen. The most common sensitizations were to nuts and seeds (43.2%, mostly Cor_a_1.0401, Hel_a), fruits (38.4%, mostly Fra_a_1+3, Mal_d_3), and legumes (31.6%, mostly Gly_m_4, Ara_h_8). Girls were mostly sensitized to fruits (38.4%, mostly Fra_a_1+3) and nuts and seeds (35.5%, mostly Cor_a_1.0401, Pap_a), while boys were sensitized to nuts and seeds (49.4%, mostly Fra_a_1+3, Hel_a), fruits (38.4%, mostly Mal_d_1), and legumes (38.4%, mostly Gly_m_4). The boys' group was found to be more sensitized to nuts and seeds and legumes' allergen groups (p < 0.05).

Conclusion: In this study, using molecular allergy diagnostics, we determined specific food allergen components that are dominant in causing sensitization to children in Lithuania. The boys' group was significantly more frequently sensitized to nuts and seeds and legume allergen groups in comparison with girls. Girls were more sensitive to fruits than boys.
Usability of lip contact test for predicting the outcomes of cow’s milk oral food challenges

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Background: Cow’s milk (CM) is a major cause of food allergy (FA) in children. Evaluating CM tolerance through oral food challenge (OFC) is essential. Our aim is to evaluate the predictive values of ‘Lip contact test (LCT)’ in consecutive OFC outcomes.

Methods: Medical records of 184 children (median 52.5 months, 12-192 months) diagnosed with IgE-mediated CM allergy at Ajou University Hospital from 2013 to 2022 were retrospectively reviewed. All subjects underwent CM OFC, CM-sIgE, caseinsIgE, and casein-sIgG4. LCT was performed as the initial step of OFC.

Result: Fifty-eight children (31.5%) were positive to the LCT (LCT+), and 126 were negative (LCT-). There were no significant differences in gender, feeding history, atopic dermatitis, other accompanied FA, and CM anaphylaxis history between the two groups. In the LCT+ group, a higher percentage of patients experienced allergic reactions compared to the LCT- group at cumulative doses of 3 mL (67.3% vs. 27.0%), 15 mL (83.6% vs. 44.4%), and 127 mL (96.4% vs. 69.0%) (p<0.001). In LCT+ patients, CM-sIgE (median 8.235 KU/L, 0.54-100.1), casein-sIgE (median 4.50 KU/L, 0.05-100.1) and casein-sIgE/sIgG4 ratio (median 7.665, 0.14-151.33) were significantly higher (p<0.001) compared to LCT- group (CM-sIgE 2.98 KU/L; caseinsIgE 1.985 KU/L; casein-sIgE/sIgG4 ratio 2.606). Optimal cutoff levels were 6.61 KU/L for CM-sIgE (sensitivity 60.34%, specificity 68.25%), 1.67 KU/L for casein-sIgE (sensitivity 79.31%, specificity 46.03%), and 2.57 for CM-sIgE/sIgG ratio (sensitivity 77.59%, specificity 50.00%).

Conclusion: LCT as the initial step of CM OFC can be useful in predicting OFC outcomes. Notably, 27% of LCT+ patients passed the 3 mL OFC.
WAC23-0081
Stratifying Characteristics and Severity of Sesame allergy among Saudi Arabian population: Single referral center study

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Background: Sesame seeds are widely consumed in food. Sesame allergy is classified as a typical food allergen based on previous studies from Saudi Arabia and the countries, among the other common food allergens like wheat, egg, white, and cow’s milk. It is the third food allergen leading to anaphylaxis in Saudi after tree nuts and eggs, as reported by our hospital and other regional countries.

Methods: This is a cross-sectional/retrospective study of 237 patients followed at KFSHRC (KSA) from Jan 2013 to Sep 2021. Patients’ medical records have been reviewed manually and electronically for patients diagnosed with sesame allergy and other associated food allergies.

Result: 100 patients have bronchial asthma. 84 patients have allergic rhinitis, 64 patients have atopic dermatitis, patients which have allergic conjunctivitis. 9 patients have eosinophilic esophagitis. Family history of atopy was positive in 85 patients family history of food allergy were positive in 42 patient.

Conclusion: This is the first study in Saudi Arabia to identify the predictive values of different methods used to diagnose sesame allergy. We cloud not find the predictive values for a possible severe allergic reaction like peanuts allergy. However, this could be extrapolated from the available specific sesame IgE test. We believe a future analysis of sesame sub-epitopes might be more beneficial in sesame allergy. evaluation rather than the total sesame-specific IgE. Some patients with a strongly positive history had low positivity of the skin prick test for sesame, which might be pretty challenging, and mandate food challenge test for confirmation. Final point, there is not enough awareness among pediatrician and family physicians about the need to refer such patient to allergy clinic for skin testing, specific IgE and challenging if it applicable.
WAC23-0124
The complete allergen profile of two edible insect species: Acheta domesticus cricket and Hermetia illucens larvae

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Background: Edible insect protein are an excellent alternative sustainable novel food source to feed the world’s growing population. However, due to ancestral similarities and subsequent clinical cross-reactivity, edible insects can be harmful to those suffering from shellfish allergy. In this study, we investigate and identify putative and cross-reactive allergens in crickets and black soldier fly (BSF) larvae affecting people with shellfish allergy.

Methods: Food protein derived from Acheta domesticus cricket and BSF larvae Hermetia illucens were extracted and analysed by SDS-PAGE and immunoblotting using shrimp allergen-specific antibodies and sera from patients with confirmed shellfish allergy. IgE-binding protein bands were analysed by mass spectrometry and whole extract proteome was analysed to measure abundance of cross-reactive allergens. Conservation analysis was conducted using multiple sequence alignment, with a focus on allergen epitopes.
**Result:** Immunoblotting revealed cross-reactivity to tropomyosin and arginine kinase from cricket and tropomyosin from BSF. Patient serum IgE analysis identified shared but also unique allergens in both species. The proteomic analysis revealed high abundance of tropomyosin in cricket and hemocyanin in BSF larvae. Conservation analysis indicated more than 60% similarity of homologous allergens between the different species, as well as shared IgE-binding epitopes.

**Conclusion:** While tropomyosin and hemocyanin were the most abundant and immunoreactive allergens in the two insect species, six unique allergens were identified, highlighting the need for insect-specific allergen detection in food products. Recognition of these insect proteins as allergens is crucial in developing component-resolved diagnostic and management tools for optimal clinical care of affected allergy individuals.
WAC23-0146
Speaking the same language to address some of the gaps in global access to psychological services for food allergy

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Background: Patient-oriented research provides opportunity for experts-by-experience (EBE) to express their voices. To date, food allergy research has largely focused on affluent families from high-income countries. To promote inclusion of more diverse voices of EBE, we aimed to provide methodological guidance across all stages of multilingual qualitative studies.

Methods: Informed by experiences leading the Global Access to Psychological Services (GAPS) study, an international, multilingual, multiphase study, we developed a method to translate, collect and interpret data from adults and caregivers managing FA. Materials were translated from English to other languages by those whose first language is the target language of translation, then backward translated from those languages to English, by another person fluent in both the target language and English. Thereafter, translations were refined until all parties were satisfied with the translation accuracy. Patient groups reviewed and commented on translations for cultural sensitivity and patient understanding. Data collection was completed by research assistants who shared a common first language with participants. Analysis was conducted in the original language in order to retain nuances, and minimize losses of cultural context. Aston University provided research ethics approval for GAPS.

Result: We have refined this method to recruit from the United Kingdom, United States, Canada, Australia, Italy, and France, and plan expansion to Germany, Spain, Portugal, Brazil, Japan, and Hong Kong. To date, we have completed interviews in Italian (5-adults, 4-caregivers), French Canadian (2-adults, 1-caregiver), French (1-caregiver) and English (43-adults, 26caregivers).

Conclusion: Our methodological guidance on multilingual qualitative studies will enhance cultural diversity in food allergy research.
IgE binding to allergen components in patients with crustacean and mite allergies in Australia

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Background: Shellfish allergy affects up to 3% of children and adults and typically lasts a lifetime. Despite having major clinical symptoms, it is unclear how frequently distinct allergen components are recognized by IgE. In this study, crustacean allergen recognition profiles and their relations to symptoms in patients with shellfish allergy were compared.

Methods: After confirming shellfish allergy in 54 patients with a positive skin prick test or ImmunoCAP result, specific-IgE was quantified using the ALEX Allergy Explorer macroarray system (Macro Acro Diagnsotics, Vienna) containing 117 allergen extracts and 178 purified allergen components, including five crustacean allergen components.

Result: IgE binding to any crustacean allergen/extract was observed in 74% of patients. This included 41% to TM, 26% to TpC, 22% to AK, 13% to SCP, and 4% to MLC. When comparing IgE reactivity to homolog shrimp components in other allergen sources, considerable binding ranged from 41-48% of patients. About 50% of the patients only display one symptom and the most frequent symptoms are oral allergy syndrome (OAS) (51.5%) followed by urticaria (33.3%) and respiratory diseases (22.7%).

Conclusion: The number of people with sIgE to the main crustacean allergen TM was lower than expected, while binding to the homologous allergens TM and AK in dust mite, cockroach and Anisakis indicated the same or higher frequency of binding compared to the crustacean. This highlights TM and AK’s role as important cross-sensitising pan-allergens. Furthermore, OAS is one of the most typical symptoms in people with shellfish allergies.
Impact of food allergy on children and parental quality of life

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Background: Increasing food allergy prevalence is a significant concern globally. There is no effective treatment, posing heavy burdens on families. Our objective is to investigate factors influencing quality of life (QoL) of children and their parents living with a food allergy.

Methods: Families with food-allergic children aged 2-6 (n = 49), 7-12 (n = 22), and 13-17 (n = 6) were recruited. Parents completed a Food Allergy QoL (FAQL)-Parental Burden form during recruitment. Data was divided into Parent’s Perception of Child (PPOC) and Parent’s Own Perception and Feelings (POPF) for factor analysis.

Result: Analyses of baseline information of 77 parents with food-allergic children, earlier food allergy diagnosis was associated with higher maternal educational level (p = .014). Regarding PPOC, a diagnosis of tree nut allergy (p = .026), avoidance of tree nuts (p = .018) and crustaceans (p = .021) were associated with lower QoL. Mother, instead of father, had higher anxiety towards children’s social activities outside home because of their food allergies. For POPF, parents of children aged 13-17 experienced less decline in happiness (p = .044), while those with another food-allergic child had higher deterioration (p = .029). Parents with young food-allergic children had more frustration (p = .048) and anxiety (p = .026) than those with older food-allergic children.

Conclusion: Mothers with young and more than one food-allergic child were at higher risk of parental anxiety, depression and frustration. Food avoidance generally demonstrates higher FAQL scores than food allergy, possibly from active avoidance.
WAC23-0275

Significant Economic Impact of the COVID 19 Pandemic on Food Allergy Families

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Background: Families with food allergy have particularly faced numerous challenges often in the setting of financial and emotional stress during the COVID 19 pandemic. We examined the impact of the pandemic in a diverse multinational population of families with food allergy.

Methods: An online survey was administered between September 2020 to January 2021 through recruitment of adult caregivers of at least one food allergic child.

Result: Of the 323 questionnaires that were examined, 95.7% were female with 80.5% of respondents non-Hispanic white and the remaining 19.5% comprised of African American, Hispanic or Latin X, Asian and “other”. Respondents were from Canada, the U.S., the U.K and Europe. Fifty-two percent of respondents experienced a decrease in household income in the pandemic. Seventy-five percent of respondents experienced increased stress or discord within the home. Specifically, families with incomes less than 50k were significantly more likely to feel that having a child with food allergy was associated with more financial problems (p=0.03) and a change in household income (p=0.004) They also experienced a change access to medical care. (p=0.001) Families in this income level also experienced more stress related to the pandemic. (p=0.009)

Conclusion: Our questionnaire has characterized the significant impact of economic as well as psychological stressors of the pandemic in an international diverse population. Further studies are needed in this topic to help minimize the impact of future pandemics in a multicultural population.
Interaction between lifestyle, immunity and gut microbiota in milk allergy children

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Background: The interaction between the immune system and microbiota is crucial in the human body homeostasis, but it is unclear how they interplay in food allergy children. We sought to characterize the complex interactions between the immune system and gut microbiota in milk allergy children.

Methods: We performed a post-hock analysis for the milk allergy children in the TOY Study (jRCTs031180180). We analyzed the Spearman correlations for background information, serum cytokines, and gut microbiota. For robust clustering of the children, a random forest (RF) dissimilarity measure was used to evaluate similarity among them based on multiple variables. RF dissimilarity was used as input for t-distributed Stochastic Neighbor Embedding (tSNE) plots.

Result: The correlation of the timing of weaning food with brave and the correlations of maternal highest education with IL-13, IL-33, and SDF-1 were strongly observed. The correlation of MIP-1α with F. Lachnospiraceae2 and the correlations of IL-16 with Coriobacteriaceae and uniformis were also strongly observed. There were three clusters, Cluster 1 (TSLP, IL-3, LIF, and distasonis were high), Cluster 2 (IFN-α2 and IL-1β were low. Rikenellaceae and Lachnospiraceae2 were high), and Cluster 3 (TNF-α and IFN-γ, TARC, Streptococcaceae, Fusobacteriaceae, and Enterococcaceae were high and Ruminococcaceae was low).

Conclusion: The lifestyle, immune system, and gut microbiota were likely to have complex interactions in milk allergy children.
Background: Data on food allergies (FA) in Sri Lanka are scarce. Thus, we attempted to identify the patterns, aetiology, and risk factors of FA in Sri Lankan children.

Methods: 161 children who had a suspected history of food allergy, referred to our allergy clinic were recruited to the study. Socio demographics and relevant clinical data were gathered via using an interviewer administered questionnaire. Skin prick test (SPT), specific IgE test and ISAC immunocap tests were performed to confirm the FA.

Result: 87/161 (54.04%) children were males. The median age of the cohort was 8 years. 131/161 (81.37%) children tested positive for at least one of the FAs. 43/161 (26.71%) children tested positive for >3 types of FAs and 23/161 (14.29%) tested positive for > 5 types of FAs. 39/161 (24.22%) of children had allergies to cow’s Milk, 39/161 (24.22%) to alpha-gal, 29/161 (18.01%) to mammalian meat and 19/161 (11.8%) to egg. Allergy to sea food, coconut milk, fish, fruits, Omega-5-gliadin, nuts, legumes and vegetables were seen in 5–10% of children. The food allergens had triggered anaphylaxis in 89/161 (55.28%) children while others had only gastrointestinal or skin manifestations. Frequency of having FA was relatively higher in children who have used any kind of antibiotics > 1 week during their infancy (OR 1.092, 95 CI 0.51 to 2.4), although not statistically significant (p=0.84)

Conclusion: Cow’s milk and alpha gal were the most common FA in children, but tree nut and peanut allergy were rare when compared to western countries.
Increased Food Allergy Prevalence at 7 years old children was inversely related decreased trends of atopic eczema (From Sagamihara Allergy Cohort studies with 12 years interval)

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Background: Based on the results of our two cohort studies with 12 years interval, we have previously reported an increase in the prevalence of food allergies (FA), a decrease in bronchial asthma, and an increase in Japanese cedar pollinosis from 2014–2021 survey compared to 2002–2009. In this report, to compare the prevalence of allergic diseases associated with FA diagnosed at age 7 (7y-FA group) and without FA (7y-nonFA group) between 2014–2021 and 2002–2009, and to identify changes over the 12 years between the two groups.

Methods: Children who answered the survey were divided into 7y-FA and 7y-nonFA groups, and the complication rates of allergic diseases at 4 months, 8 months, 1 year, 3 years, 5 years, and 7 years of age were compared between the two surveys.

Result: We analyzed the surveys of 2,172 children for 2002–2009 and 2,325 children for 2014–2021. In the 7y-FA group, the prevalence of atopic eczema was significantly decreased at all points. Tree nuts allergy increased significantly from 5.7% to 25.5%, and allergy to fish eggs, mainly salmon roe, increased significantly from 1.4% to 15.0%. In the 7y-nonFA group, no significant such differences were seen between both surveys.

Conclusion: The prevalence of atopic eczema decreased in the 7y-FA group compared to that 12 years ago. The increase of FA at 7 years old mainly comes from the increase of tree nuts allergy but not associated with atopic eczema.
WAC23-0297
Atopic Disease Prevalence in Pediatric Liver Transplant Recipients

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Background: Atopic diseases in pediatric liver transplant (LT) recipients are gaining recognition, but their development and resolution are not well understood. This study aims to determine prevalence, onset, and remission rates of food allergies (FA), allergic rhinitis (AR), and asthma in these children.

Methods: This study involved liver transplant patients under 20 years old, surviving a minimum of 6 months during 2001-2021. Researchers used established criteria to diagnose FA, AR, and asthma.

Result: Among the 53 post-liver transplant children, atopic diseases developed in 24 cases (45.3%). FA was observed in 20 cases, with an onset occurring at a mean time of 13 months after LT. Single food allergies accounted for 40% of cases, of which 75% were outgrown at a mean of 24 months after eliminating the triggering foods. Multiple food allergies were present in 60% of cases, and 25% of these cases outgrew all allergies at a mean of 30 months. Regarding food allergy cases, 75% were classified as IgE-mediated, main culprits being cow's milk, seafood, egg white, fish, and egg yolk. Non-IgE-mediated food allergies accounted for 25%, involving cow's milk, soy, egg white, and egg yolk. Eleven cases developed AR, with 50% of the subjects showing sensitization to aeroallergens. The onset of AR occurred at a mean time of 46 months after LT. Six cases of AR were accompanied by food allergies. Asthma was observed in only one case.

Conclusion: Atopic disease emerged in 45.3% of pediatric LT recipients, notably in IgE-mediated FA, mainly attributed to cow's milk and seafood.
WAC23-0303
Food allergy epidemiology in preschool children in Thailand

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Background: The rising trend of food allergy among children has consequential impacts on both the quality of life of patients and their families.

Methods: This study represents a preliminary investigation focused on self-reported food allergy. The data was gathered through a questionnaire distributed among a randomized sample of children aged 3 to 6 years in Thailand throughout all regions.

Result: In this study, 346 participants were enrolled, with males representing 51.4% of the total. Mothers were the main caregivers and also completed the questionnaires (77.7% and 80.6, respectively). It was revealed that 34.1% of the children had a family history of atopy, mainly allergic rhinitis. Physician diagnosed atopic diseases were found in 27.4%, including allergic rhinitis (10.3%), atopic dermatitis (6.6%), asthma (6.4%), and food allergies (3.8%). The prevalence of self-reported food allergies was 0.05%. The most suspected food were seafood (44.4%) and cow’s milk (38.9%), followed by egg white (5.6%), egg yolk (5.6%), and wheat (5.6%). The most clinical manifestation of food allergy symptom was urticaria (83.3%). Notably, most children with suspected food allergies exhibited at the initial consumption.

Conclusion: The prevalence of self-reported food allergies among Thai preschool children was low, only 0.05% in preliminary study. Seafood was the most suspected trigger, followed by cow’s milk. Symptoms typically manifested upon the first consumption, with urticaria.
Sustained clinical and histopathological remission in eosinophilic esophagitis and atopic dermatitis after one year of discontinuation of dupilumab

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Background: Eosinophilic esophagitis (EoE) and atopic dermatitis (AD) are diseases that occur relatively frequently as morbidities in patients affected by type 2 inflammatory diseases. Dupilumab as an IL-4α receptor inhibitor has demonstrated sustained efficacy in patients treated with this type of drug. In the case we comment a clinical and histopathological remission of these diseases after 3 years of treatment and maintaining the remission after one year of suspension.

Case study: A 24yo male started since 7 with severe AD, affecting 75% of the body surface area, at 16yo started with episodes of dysphagia and reflux deriving at age 17 and 18yo with 2 episodes of esophageal impaction, meeting criteria for EoE. From 19yo, Dupilumab was started for the treatment of AD: 300mg every 2 weeks, reaching EASI-75 at week 8 of treatment; gastrointestinal symptoms with significant improvement reaching clinical and histopathological remission 6 months after starting treatment reporting biopsies without eosinophils. Presenting with a favorable and sustained evaluation since the first year of treatment, the patient maintained sustained EASI-100, requiring no more than emollient cream as primary therapy for AD and with totally absent gastrointestinal symptoms, repeating endoscopies at 2 and 3 years. of therapy with clinical, anatomical, and histopathological remission. After three years of treatment, biological therapy was suspended, clinical and histopathological remission continued in both AD and EoE.

Conclusion: It is possible that epigenetic changes (methylation) in promoter or disease-associated genes occur and that explains the sustained remission up to now, studies in this regard are necessary.
Genomic analysis of mud crab (Scylla serrata) identifies food allergens of Decapoda species

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Background: Mud crabs can be a concern for individuals with a shellfish allergy due to its potential to induce allergic reactions, which accounts for more than one-third of allergy cases in Hong Kong. Scylla (S.) serrata, belonging to the order of Decapoda, is one of the most consumed crab species in Hong Kong and Southeast Asia. The study aims to investigate the allergenic properties of mud crab S. serrata at the genomic level.

Methods: We conducted a comprehensive study by assembling a high-quality genome of S. serrata using advanced sequencing techniques, including Nanopore sequencing and Single Tube Long Fragment Read (stLFR) sequencing. Transcriptomes of six tissues were assembled to facilitate genome annotation. Allergens were identified with BLAST matching the proteins deposited in the database of WHO/IUIS Allergen Nomenclature.

Result: The de novo assembled genome demonstrated a high level of completeness, as evidenced by the significant BUSCO score of 91.1% for assembly and 90.8% for annotation. Through the annotation of 21,694 protein-coding genes, we successfully identified 11 gene families in mud crabs matched to known shellfish allergens present in Decapoda, of which 5 of them are putative allergens of mud crabs.

Conclusion: These findings provide insights into the allergen profile of S. serrata, shedding light on its potential allergenicity. Further immunoassays will validate and explore the allergenic potential of this species.
Plant food allergy: Be aware of allergenic plant food and related species in Thai food!

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**Background:** Allergen avoidance is the primary, crucial step recommended by physicians to reduce allergic morbidity. Foodallergic patients are not only suggested to avoid the specific species of plants that they are allergic to, but also should avoid closely-related plant species due to the high rate of cross-reactivities. Most attention has been focused on reported plant sources in Western diets. However, basic information regarding allergenicity of ingredients in Thai cuisine and closelyrelated species is lacking. Thus, we aimed to explore the ingredients in Thai cuisines that could potentially serve as allergen sources, based on the taxonomic relationships.

**Methods:** Ingredients of 12 traditional Thai dishes are listed based on the APG. Forty-nine plant species were mapped to the plant phylogenetic tree using the APG IV systems of flowering plant classification, along with 77 species previously reported as sources of food allergens in the WHO/IUIS Allergen Nomenclature Sub-Committee (http://www.allergen.org/) database.

**Result:** Among 49 plant species used as ingredients in 12 Thai dishes, seven plant species have been reported as allergen sources. Twenty- two species belong to the same botanical family as the previously reported allergenic plant sources, indicating a potential source of hidden allergen. Massaman curry was the most noteworthy dish with three reported plants and six potential hidden allergen sources.

**Conclusion:** The knowledge from this study could benefit plant food-allergic patients by providing guidance to avoid consuming Thai dishes that contain potentially allergenic food sources, effectively reducing cross-reactivity caused by hidden allergens from unreported plant species and ensuring their safety while staying in Thailand.
WAC23-0314
A Review of Peanut and Tree Nut Allergy in a Secondary Care Paediatric Allergy Service (Preliminary Data) Lister Hospital, East and North Hertfordshire NHS Trust

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Background: To develop a database of peanut and tree nut allergic patients reviewed at the Paediatric Allergy Service and to review management based on BSACI guideline which will aid in risk stratification of patients for consideration of oral peanut immunotherapy.

Methods: This is a retrospective review. Data was collected from a database of allergy action plans and clinical notes of children who have been reviewed in Paediatric Allergy Clinic with focus on clinical history, signs and symptoms, and clinical management including allergy testing results. The data was entered directly into Microsoft excel and analysed.

Result: This is the preliminary data based on review of all patients diagnosed with peanut and tree nut allergy. There are 223 patients identified thus far: 50.67% have peanut allergy, 8.96% have tree nut allergy and 23.31% have both peanut and tree nut allergy. 40.36 % had SPT, 24.22 % had Specific IgE, and 29.15% had both. Out of 223 patients, 63.68% are male; 36.32% are female. Majority of patients (69.96%) have mild to moderate symptoms, whilst 28 % had anaphylaxis. Of the 223 patients, 28% have history of anaphylaxis and carry adrenaline auto-injector (AAI) devices with corresponding training on administration. All nut allergic patients have an allergy action plan, patient information leaflet, and advice regarding avoidance of allergens. 56.5% have associated eczema, 35.43% with asthma and 20.63% with other associated food allergy, predominately the egg and milk.

Conclusion: Based on our data, our patients with nut allergy have been appropriately managed according to BSACI guidelines, with particularly useful.
WAC23-0345
Yogurt tolerance in patients with milk allergy according to allergen sensitization profile

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Background: In Cow’s Milk Protein Allergy (CMPA) the restrictive diet is the only valid accepted alternative. Therapeutic alternatives have been developed, such as hyposensitization with milk. Beta-lactoglobulin (BLG) sensitization has been studied as a possible predictor of tolerance to yogurt.

Methods: Retrospective analysis of patients <6 y.o. with CMPA: detection of positive specific IgE to milk (prick/seric), and confirmed by oral exposure test or having very suggestive symptoms (in the last 6 months). Excluded anaphylaxis. They will be classified into 2 groups: A) predominance of + Beta-lactoglobulin (BLG), and B) predominance of sensitization to other PLVs. Oral exposure test with yogurt (125g) will be carried out in both groups in the Allergy Unit. Follow-up to baseline at 6 and 12 months: clinical presentation referred will be analyzed, along with profiles of allergenic sensitization to milk proteins.

Result: A total of 90 yogurt challenges carried out: A) BLG predominance: n=42 (mean age 2.7±2.3 y.o), 95% tolerance to yogurt immediately, only 2 patients rejected due to mild abdominal cramps; B) non-BLG predominance: n= 48 (mean age 2.5±2.1 y.o), only 37.5% (18) achieved tolerance, 35.5% (17) rejection due to pruritus oral, and 20.9% facial urticaria and/or 6.1% mild diffuse urticaria. No anaphylaxis in any group. Clinical follow-up: A) 100% maintenance of tolerance at 6 and 12 months; B) only 10/48 patients maintained tolerance at 12 months.

Conclusion: Yogurt is well tolerated in a significant group of CMPA patients with sensitization to BLG. Identification of the sensitization profile may be useful when making therapeutic decisions in CMA.
WAC23-0355
Association between food allergy and rhinitis: a systematic review and meta-analysis

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Background: Although several studies have reported the association between food allergy and rhinitis, the findings are conflicting. We conducted a systematic review and meta-analysis for the objective outcome of the association between food allergy and rhinitis.

Methods: We summarized earlier data on food allergy and rhinitis using PRISMA guidelines. PUBMED, Web of Science and SCOPUS databases were searched prior to October 2021. All observational studies (cross-sectional, case-control and cohort) on food allergy and rhinitis were considered, Duplicate and non-relevant studies were excluded.

Result: A total 35 were considered appropriate for inclusion from 4348 articles identified. The prevalence of patients with history of rhinitis among those with food allergy was 46.7% (95% CI: 34.7%, 59.1%) and prevalence of patients with rhinitis symptoms post food allergen exposure among those with food allergy 22.8% (95% CI: 12.9%, 37.0%). Individual with food allergy are 3.36 times and 31.36 times more likely to have history of rhinitis and rhinitis symptoms post food allergen exposure with significant and non-significant result respectively. There was marked heterogeneity between studies.

Conclusion: We found that food allergy was associated with history of rhinitis. No significant association was seen between food allergy and rhinitis symptoms post food allergen exposure. Therefore, a proper randomized control trial study is required to determine this relationship.
WAC23-0206
Analysis of IgE binding ω5-gliadin profile of wheat allergic patients using multiple IgE epitopes of the N-domain or the C-domain of ω5-gliadin

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Background: Omega 5 gliadin (ω5-gliadin) is one of the major wheat allergens inducing wheat anaphylaxis (ANA) as well as wheat-dependent exercise-induced anaphylaxis (WDEIA) in Thai allergic individuals. This preliminary study aimed to determine a role of multiple IgE epitopes located in the N-domain (NOME) or C-domain (COME) of ω5-gliadin in causing symptoms of the 2 patient groups.

Methods: Recombinant chimeric proteins coding modified multiple IgE epitopes in NOME (Trx-NOME) or COME (Trx-COME) were expressed in E.coli cells, purified before tested for either serum or plasma specific immunoglobulin E (sIgE) reactivity by indirect ELISA.

Result: The preliminary results showed 6 of 8 ANA patients had sIgE bound the Trx-COME similar to recombinant ω5-gliadin (r-ω5) coding the entire C-domain. Three WDEIA patients had sIgE bound only to r-ω5, while 1 WDEIA patient had sIgE bound to all tested proteins, the Trx-NOME, the Trx-COME, and r-ω5.

Conclusion: These preliminary findings suggested a possible involvement of multi-epitopes in the N-domain of ω5-gliadin in WDEIA while the C-domain of ω5-gliadin may involve in wheat anaphylaxis. Further experiments would be needed to confirm these observations.
Galacto-oligosaccharides (GOS) allergy- An evaluation of GOS-induced basophil activation

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Background: GOS is a synthetic prebiotic comprised of oligosaccharides with molecular weights below 2kDa. We have previously described cases of IgE-mediated acute allergy to GOS. The mechanism on how low molecular weight oligosaccharides in GOS cross-link IgE and activate basophils remains unsolved. This study examines whether cell-cell interactions are involved in GOS-induced basophil activation.

Methods: Blood samples were collected from GOS allergic subjects (n=4) and non-GOS allergic controls (n=4). Both groups were IgE-sensitized to dust mite Blomia tropicalis (Blo t). Basophil activation test (BAT) to GOS was conducted using whole blood from all subjects. Peripheral blood mononuclear cells (PBMC) and purified basophils (purity mean (SD): 87.8% (6.9%)) from GOS allergic subjects were also subjected to BAT. CD63 expression was assessed using flow cytometry. The degranulation process of stimulated purified basophils was monitored using time-lapse confocal microscopy with avidin sulforhodamine (Av.SRho) and anti-CD63 antibody.

Result: All GOS allergic subjects, but not non-GOS allergic controls had a positive BAT response to GOS in the whole blood assay. In GOS allergic subjects, a reduced percentage of basophil activation to GOS was observed in BAT using PBMC (range: 6.2%-62.0%) or purified basophils (range: 1.9%-61.6%) compared to whole blood (range: 16.2%-69.9%). Confocal microscopy analysis of purified basophils showed GOS-
induced basophil activation in GOS-allergic subjects but not control subjects. Through direct microscopic monitoring of each basophil, we observed that GOS-stimulated basophils could undergo degranulation without contact with neighboring basophils.

**Conclusion:** Results indicate that despite its low molecular weight, GOS can activate basophils independently of cell-cell contact with adjacent basophils and other immune cells.
Validation of recipe for double-blind placebo-control food challenges with fish

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Background: Fish allergy is one of the most common food allergies in Hong Kong. Although double-blind placebo-controlled food challenges (DBPCFC) are considered the gold standard for diagnosing food allergies, there is no standardised recipe for fish. This study aims to develop and validate recipes for fish DBPCFC.

Case study: A recipe consisting of codfish, potatoes, cauliflower, corn, carrot, onion, cumin, and onion powder was developed. Triangle tests were conducted with 30 subjects aged 10-60 to validate the recipe. Each subject was given 3 samples sequentially with 15-minute intervals. Water and crackers were given as palate cleansers. They were asked to identify the odd sample through a questionnaire, and a nine-point hedonic scale was used to evaluate their acceptance of the recipe. For a β-risk of 0.10 and a Pd of 30%, the maximum number of correct responses allowed to validate the recipe is 11. As 10 out of 30 subjects correctly identified the odd sample, the recipe was validated. 80% of those who correctly identified the odd sample selected texture as one of the characteristics that made the sample different, followed by taste (70%) and appearance (30%). On the nine-point hedonic scale, ranging from 1, "dislike extremely", to 9, "like extremely", a median of 6 (interquartile range: 4–7) and a standard deviation of 1.72 were found.

Conclusion: The recipe for blinding codfish is validated and can be used in clinical settings. Further improvements could be made to the texture and taste to improve its blinding ability.

WAC23-0217
Validation of recipe for double-blind placebo-control food challenges with fish
WAC23-0218
Rambutan anaphylaxis: case report of an 11-year-old Thai boy

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Background: Anaphylaxis is a systemic reaction classically caused by an IgE-mediated response. Fruit and vegetables can also cause the reaction, although not common. Rambutan (Nephelium lappaceum) is a tropical fruit and widely available in Southeast Asia. It belongs to the family Sapindaceae which is closely related to lychee and longan.

Case study: This case report presents an 11-year-old Thai boy with two episodes of reactions 15 minutes after ingesting fresh and canned rambutans, respectively. He experienced oral itching during the first episode and generalized urticaria, nasal congestion, and chest tightness during the second episode. After treating the acute reactions, he was referred to our hospital for further investigation. He has a known history of allergic rhinitis without any reactions to other fruit, including lychee and longan. His reaction developed without any associated co-factors, e.g., exercise. Skin prick test (SPT) with fresh rambutan and canned rambutan were performed and reviewed mean wheal diameters of 9 mm, and 8.5 mm, respectively. His SPT was also positive for dust mites but negative for Aspergillus spp., Penicillium spp., and wheat. Upon completely avoidance of rambutans, he reported no further history of allergic reactions.

Conclusion: Rambutan is not a common causative agents to cause allergic reactions and thus true incidence maybe underestimated. Glyceraldehyde-3-phosphate dehydrogenase (GAPHD) has been identified as the major allergen in rambutan, and other allergens such as wheat, kiwifruits, and Aspergillus spp. However, cross-reactivity within these group has not been reported.
The serum cytokine profile differs between persistence and remission in children with food allergy

Assistant Professor Eom Ji Choi, Assistant Professor Eom Ji Choi, Assistant Professor Jisun Yoon, Assistant Professor Kun Baek Song, Dr. Eun Young Baek, Dr. Da kyeong Lee, Professor Soo-Jong Hong, Professor So-Yeon Lee, Professor Kangmo Ahn, Professor Jihyun Kim, Professor Dong In Suh, Professor Kyung Won Kim, Professor Youn Ho Shin, Si Hyeon Lee, Seoung Hwa Lee

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Background: Studies for food allergy (FA) trajectories and their natural courses are rare. We aimed to identify phenotypes of FA according to their natural course and serum cytokine profiles of each trajectory.

Methods: A total of 1,518 children from the Cohort for Childhood of Asthma and Allergic Diseases (COCOA) study were enrolled. Diagnosis of FA was conducted by pediatric allergists. Group-based modeling of longitudinal data was used. The serum cytokine levels of 3 year-old were analyzed.

Result: Children were classified into the following 4 phenotypes of FA: no FA (87.3%); early remission (6.9%); early persistent (4.6%); and late remission of FA (1.1%). At age 3, IL-2 and IL-10 levels were higher in both the early and late remission groups compared to the controls. Additionally, IL-15 levels were elevated in both remission
groups when compared to the early persistent group and controls. IL-4, IL-5, IL-6, and IL-17A were all found to be increased in the early remission group when compared to the controls. The early persistent FA had a higher incidence of sensitization compared to the controls until 7 years of age and showed differences in asthma and bronchial hyperresponsiveness (BHR) at 7 years of age compared to the controls and early remission phenotype.

**Conclusion:** These results suggest that IL-2, IL-10 and IL-15 are involved in the acquisition of FA tolerance. Further studies are needed to elucidate the role of these cytokine in the natural course of FA.
**WAC23-0231**

**HLA Associations Study in IgE-Mediated Banana Allergy: A Case-control Study in a Thai Adult Banana Allergy Cohort**

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**Background:** Banana allergy is prevalent in tropical regions, yet the genetic underpinnings of IgE-mediated banana allergy remain uninvestigated.

**Methods:** This case-control study was conducted in May 2019 to June 2022, recruiting adults with banana allergies (confirmed by allergology tests). A control group of non-allergic individuals was included. High-resolution HLA genotyping was carried out for all 11 loci of HLA genes. This was accomplished using the One Lambda AllType 11-Loci Amplification kit to amplify DNA, followed by sequencing with the Ion S5XL system. HLA genotype calling was performed using the TypeStream Visual NGS Analysis Software. Statistical analysis involved Fisher's exact or chi-square tests in calculating odds ratios (ORs) with 95% confidence intervals (CIs). Bonferroni correction was applied for multiple testing, with p-value/[total number of alleles] used to determine statistical significance. The Allele Frequency Net Database (www.allelfrequencies.net) was also utilized to calculate the allele enrichment ratio (ER).
**Result:** The study included 59 cases and 64 controls. HLA genotyping and statistical analysis revealed potential associations of HLA-B15:25 (OR 11.872), HLA-C04:03 (OR 7.636), and HLA-DQB106:09 (OR 11.558) with banana allergy. However, after Bonferroni correction, none of these associations reached statistical significance. The enrichment ratio analysis indicated a higher prevalence of B15:25 (ER 1.849), C04:03 (ER 1.332), and DQB106:09:01 (ER 6.602) alleles in the banana allergy group compared to the general population.

**Conclusion:** Although 12 alleles showed potential associations with banana allergy without correction for multiple testing, none remained statistically significant. Further research with a larger sample size is needed to possibly detect significant correlations.
Food allergy oral food challenge outcomes and predictors: a multicentre cohort study.

Background: Food allergies affect 1 in 2 households and over 3 million Canadians. While oral food challenges (OFCs) remain the gold standard diagnostic test for food allergies, evidence addressing predictors and outcomes of OFCs are limited to certain foods or populations. Our project aims to determine the predictors of OFC outcomes, their severity and eliciting doses of allergens.

Methods: We analyzed all consecutive OFCs done at one tertiary hospital and nine community clinics between January 1, 2018 to December 30, 2022. Eligible patients underwent an OFC to a single food allergen. Local ethics boards approved the study. We report preliminary findings of a subsample of participants.

Result: Of 309 out of 3380 total patients identified from 9 out of the 10 study sites, age was bimodally distributed with 195 children (less than 18 years old) being a mean (SD) age of 7.40 (5.49) years and 95 adults being 42.53 (17.61) years. The most common food challenged were tree nuts in children (n=49, 25%) and crustaceans and mollusks in adults (n=33, 29%). 19.4% (n=60) of all participants reacted during their OFC. Six required oral antihistamines meanwhile none required oral or IV corticosteroids, nor epinephrine administration. No serious adverse events occurred.

Conclusion: In this preliminary subsample of the overall cohort, 4 out of 5 patients with suspected food allergy were not allergic. Supporting the safety of OFC, those that were determined as allergic had mild and easily treated reactions to OFC.
POSTER PRESENTATION

PDS3: Dec 2, 2023
(10.00-10.30)
WAC23-0111
Anaphylaxis due to dexketoprofen Trometamol with tolerance to Ibuprofen.

Dr. Ambrosia Angelina Vásquez Bautista¹, Dr. Ambrosia Angelina Vásquez Bautista¹, Dr. Antonio Perez Pimiento¹, Dr. Angel Luis Villalon Garcia¹, Dr. Rosa Perez Durban¹, Dr. Tania Davila Teran¹, Dr. Alfredo Iglesias Cardaso¹

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Background: Dexketoprofen trometamol is a water-soluble salt of the dextrorotatory enantiomer of the nonsteroidal antiinflammatory drug (NSAID) ketoprofen and anaphylaxis with tolerance to others from the same group have been rarely reported.

Objective: to describe a case of severe anaphylaxis due to intravenous Enantyum (dexketoprofen Trometamol) in an adult male from Spain who tolerates ibuprofen.

Case study: A 47-year-old male, with a history of allergy to nuts with a positive LTP pattern and mild rhinoconjunctivitis due to allergy to olive and arizonic pollen. Attended the allergy clinic in April 2023 with a history that in 2017 during a hospitalized due to leg fracture he was given an intravenous infusion of Enantyum trometamol and 30 minutes later he presented significant angioedema of the tongue, pharyngeal occupation, difficulty breathing, generalized wheals, an imminent sensation of death, subsequently he has tolerated ibuprofen 600 mg on multiple occasions and other NSAIDs from different groups. Skin prick test were performed with Enantyum trometamol at a concentration of 50 mg/2ml. Results: Prick test with Enantyum trometamol: 6x6 mm plus erythema. IDR: not performed due to positivity in the prick test. Histamine positive control in prick test: 5x5 mm. Physiological saline solution control in prick test: negative.

Conclusion: Conclusion: We report a clinical case of severe anaphylaxis due to intravenous dexketoprofen trometamol, that 6 years after the reaction occurred it still remains a positive skin prick test, suggesting a selective IgE-mediated hypersensitivity mechanism.
WAC23-0118
Consensus algorithm and Simulation Testing on Direct Penicillin Provocation Testing in the Asia Pacific

Assistant Professor Philip Li1, Professor Rommel Crisenio M Lobo2, Dr. Padukudru Anand Mahesh3, Dr. Sonomjamts Munkhbayarlakh4, Professor Ticha Rerkpattanapipat5, Dr. Minmoon Tang6, Professor Hye-Ryun Kang7, Associate Professor Bernard Thong8, Dr. Masao Yamaguchi9, Dr. Duy L Pham10, Dr. Chandima Jeewandara11, Professor Michaela Lucas12, Dr. Juan Meng13

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13Doctor, West China Hospital, Sichuan University, China

Background: The overwhelming burden of incorrect penicillin allergy labels remains a global public health concern. Many countries of the Asia Pacific (AP) have very limited access to allergy services or specialists and there are significant variations in penicillin allergy evaluation across the region. We developed a regional consensus on direct drug provocation testing (DPT) for delabelling penicillin allergy, taking into the account the distinct epidemiology, patient/sensitization profiles, as well as disparities of allergy services or facilities within the AP.

Methods: A consensus algorithm was formulated by 13 members of the Drug Allergy Committee of the AP Association of Allergy, Asthma and Clinical Immunology, representing one country/region of the AP. The algorithm was tested through a simulation-run based on database of anonymized patients who were sequentially referred for and completed penicillin allergy evaluation in Hong Kong.
Result: We present a consensus algorithm employing a “Hub and Spoke” approach to foster multidisciplinary collaboration between allergists and non-allergists. A simulation run of the algorithm on 439 patients was performed. Overall, 367 (84%) of patients were suitable for direct DPT and reduced the need for skin testing or specialists care for 357 (97%) individuals, who were skin test negative. Out of those, 345 (94%) patients would have a negative DPT.

Conclusion: We demonstrate the potential of this strategy on mitigating the need for specialists or unnecessary skin testing and propose this region-specific algorithm be implemented and further validated in other AP populations.
WAC23-0157
Development and validation of the Short Drug Hypersensitivity Quality of Life Questionnaire (DrHy-Q6) using item response theory

Mr. Hugo Wai Fung Mak\textsuperscript{1}, Mr. Hugo Wai Fung Mak\textsuperscript{1}, Dr. Jane Chi Yan Wong\textsuperscript{1}, Miss Dorothy Lam\textsuperscript{1}, Miss Elaine Lee\textsuperscript{1}, Mr. Jackie Yim\textsuperscript{1}, Assistant Professor Philip Hei Li\textsuperscript{1}, Dr. Valerie Chiang\textsuperscript{2}, Professor Antonio Romano\textsuperscript{3}

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\textsuperscript{3}Immunology/Allergy, Oasi Research Institute-IRCCS, Troina, Italy

Background: Drug hypersensitivity reactions (DHR) can significantly impair patients’ health-related quality of life (HRQoL). However, tools for HRQoL assessment for patients with DHR are time-consuming and remain underutilized. This study aims to develop and validate an optimized version of the Drug Hypersensitivity Quality of Life Questionnaire (DrHy-Q) designed for everyday clinical use.

Methods: Based on item response theory (IRT): item discrimination, difficulty and information were evaluated for each of the 15 questions of the original DrHy-Q using data from 243 patients with histories of suspected/confirmed DHR. Accordingly, the best-performing items were identified to develop a 6-item optimized version (DrHy-Q6), with its validity and reliability assessed and compared with the full DrHy-Q for validation.

Result: All 15 items of the original DrHy-Q demonstrated satisfactory parameters in IRT analysis, including very high discrimination (>1.7), appropriate difficulty (in between -1.5 and 1.5) and good information. Six items with top-ranked discrimination and information level plus appropriate difficulty level were identified to construct an optimized version. The DrHy-Q6 demonstrated an improved fit to the 1-factor model (comparative fit index = 0.993, Tucker–Lewis’s index = 0.989), excellent convergent validity (Unadjusted Pearson correlation with the full version = 0.955; adjusted = 0.894, \(p<0.001\)) and reliability (Cronbach’s \(\alpha\) and McDonald’s \(\omega\) = 0.94).

Conclusion: From an IRT perspective, the DrHy-Q as a whole and all its constituent items are psychometrically valid for HRQoL assessment. We propose an optimized 6-item version (DrHy-Q6) as an abbreviated alternative for assessing HRQoL in patients with DHR, especially for routine use in clinical practice.
PROGESTERONE HYPERSENSITIVITY: A CASE REPORT.

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Background: Progestogen hypersensitivity (PH) is a rare allergy reaction to endogenous progesterone and/or synthetic progestins. The presentation of PH is heterogeneous and can start at any time from menarche to menopause in reproductive aged women. Clinical features are very varied, depending on the type of hypersensitivity mechanism involved. It can be presented with urticaria, angioedema, anaphylaxis, maculopapular rashes, eczematous dermatitis, fixed drug eruption and erythema multiforme.

Case study: METHOD We report the case of a 39-year-old woman who started a fertilization treatment with synthetic progestins. After a few weeks of treatment, she started with itchy, followed by generalized papular rash that lasted a few days until the withdrawal of the culprit drug. Despite having stopped the fertilization treatment, she still noticed papular rashes, which gradually worsened during every second half of her menstrual cycle, corresponding to the rise of the progesterone levels. Given the suspicion of having both endogenous and exogenous hypersensitivity to progesterone, patch test with Progesterone 5% was performed. RESULTS Patch test with progesterone 5%: 2D: +; 4D: +.  

Conclusion: We present a case of Type IV hypersensitivity reaction to progesterone (exogenous and endogenous). It is important to be aware of this hypersensitivity, especially in reproductive aged women that have been treated with synthetic progestins and show periodic suggestive cutaneous symptoms.
A rapid desensitization Anti-thymocyte globulin in a patient with a history of Anti-thymocyte globulin induced serum sickness: A case report

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**Background:** There are some case reports of successful desensitization in serum sickness such as rituximab.

**Case study:** A 64-year-old male, a known case of severe aplastic anemia, was admitted for treatment with the first dose of anti-thymocyte globulin (ATG). On fifth days of ATG, he developed a generalized erythematous rash in both the armpit and groin, extended to trunk and upper extremities, a low-grade fever and arthralgia. The laboratory shown leukopenia, thrombocytopenia, complement was decreased and septic work up was negative. Serum sickness was suspected. He was given oral steroid for five days. After two days of steroid treatment, his fever subsided, and the arthralgia improved. Due to ATG was the most effective drug to treat his aplastic anemia. We discussed with the hematologist and patient. The patient agreed to receive a second dose of ATG with desensitization. He was premedicated with low-dose steroid and anti-histamine before desensitization. After the first day of desensitization, he developed a low-grade fever but had no rash or arthralgia. The hematologist decided to stop the protocol and investigate for infection which the results were negative. So, he resumed the desensitization, and until the fifth day, he didn't experience any arthralgia, fever, or rash.

**Conclusion:** This case shown the concept of desensitization in cases of serum sickness. The mechanism is still unknown, but they found that after desensitization, the anti-drug antibodies were also decreased, and T-reg cells were upregulated, which could lead to a decrease in immune complex deposition.
Multicenter, territory wide implementation of penicillin allergy delabelling by non-allergist from the Hong Kong Drug Allergy Delabelling Initiative (HK-DADI)

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Background: To overcome the magnitude of beta-lactam (BL) labels and the lack of specialists, there is increasing interest for non-allergists to perform allergy testing in low-risk cases. HK-DADI adopted a “Hub-and-Spokes” (HS) model; low-risk cases were seen at a nurse-led clinic, with either an allergist-on-site, the “Hub”, or a non-allergist, the “Spoke”. The aim was to compare the effectiveness and safety of BL delabelling under this model.

Methods: A multicenter study was conducted at four tertiary-center hospitals. Patients triaged into low-risk BL allergies underwent workup. Demographics, allergy history and de-labeling outcomes were retrospectively compared between the Hub and Spoke.

Result: Of 285 BL allergy labels, 94.4% completed workup; 94 (34.9%) from the Hub and 175 (65.1%) from the Spoke. The mean years of allergy label was 9.1 ± 6.9 years. Over half (58.7%) had difficulty in antibiotic prescription. Almost half (42%) of patients had an infection and 39% required non-BL antibiotics in the past 12 months prior to allergy testing. 94.4% allergy labels were removed, which was comparable between the Hub and Spoke (p<0.01). Positive provocation test was seen in 3/94 (3.2%) at the Hub and 6/175 (3.4%) at the Spokes, p=0.92. All positive provocation test were minor reactions. There were significantly more attendances per patient at the Spokes compared with the Hub; 2.15±0.06 vs. 1.18±0.05 (p<0.01).

Conclusion: HK-DADI was safe and effective in penicillin allergy de-labelling and proves to be a robust model for future lowrisk cases.
Clinical characteristics and tolerability to COX-2 inhibitors in NSAID hypersensitive patients

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Background: Nonsteroidal anti-inflammatory drugs (NSAIDs) are the second leading cause of drug hypersensitivity reactions. Pinpointing the exact culprit in patients taking multiple medications can be challenging for physicians. Cyclooxygenase-2 (COX-2) inhibitors have emerged as safer alternatives. This study aims to describe clinical characteristics, causative drugs, and tolerance rate to COX-2 inhibitors.

Methods: We conducted a cross-sectional retrospective study using medical records of patients aged 18 years and above, who were diagnosed with NSAID hypersensitivity at University Medical Center Ho Chi Minh City 2017 to 2023. Telephone questionnaires were supplemented. Data collection included age, sex, allergic comorbidities, reported drug hypersensitivity, NSAID involvement, onset time, symptoms, and drug provocation test results. Analysis was performed using JASP v1.6.0.

Result: A total of 141 patients were included (mean age: 33.75 years, male-to-female ratio: 1:3). Respiratory allergies, such as allergic rhinitis, chronic rhinosinusitis, and asthma were the most prevalent allergic comorbidities, occurring in 73 patients (51.8%). 88.6% of cases manifested the first symptoms within 2 hours, with angioedema (87.2%), urticaria (56.7%), and dyspnea (50.4%) being the most encountered symptoms. Among the culprit drugs, paracetamol, ibuprofen, and diclofenac ranked highest at 56.3%, 40.6%, and 21.9%, respectively. To explore safe alternatives, provocation tests with non-culprit drugs were performed. Celecoxib and etoricoxib demonstrated the tolerance rate of 95.9% (118/123 tests) and 97.2% (70/72 tests), respectively.

Conclusion: In patients taking multiple medications, angioedema emerged as a prominent symptom warranting attention with NSAID hypersensitivity. Paracetamol and ibuprofen were frequently associated with hypersensitivity reactions. Contrastingely, celecoxib and etoricoxib are well tolerated and can be considered for drug provocation test. Further multicenter prospective studies are needed in the future.
Drug reaction with eosinophilia and systemic symptoms (DRESS) with multiple drug hypersensitivity reaction: case report of a 6 years old Thai boy

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Background: Drug reaction with eosinophilia and systemic symptoms (DRESS) is a complex multisystemic severe drug hypersensitivity reaction which requires accurate diagnosis and prompt management. Culprit drug identification is crucial to ensure safety of future medication used for patients.

Case study: This case report presents a 6 years old boy with acute myeloid leukemia. During his admission for hemopoietic stem cell transplantation, he developed multiple discrete pruritic–blanchable erythematous macules and papules with central dusky-color with RegiSCAR score of 4 (probable DRESS; rash >50% of BSA, rash suggesting DRESS, atypical lymphocytes, and renal involvement). Suspected culprit drugs were itraconazole, methotrexate, and cyclosporin A, however, the enzyme-linked immunosorbent spot (ELISpot) was all negative. He received systemic corticosteroid for 2 weeks until his clinical resolved, then tapering off. He was then developed HHV-6 encephalitis and received phenytoin and levetiracetam in order to control seizure. He developed generalized denuded skin and brownish patch and facial edema 15 days after receiving antiepileptic drugs (RegiSCAR score of 2; rash >50% of BSA, rash suggesting DRESS). ELISpot was positive for phenytoin. Skin biopsy compatible with DRESS and acute graft versus host disease grade 3. Phenytoin was discontinued, systemic corticosteroid was added along with skin care for a month with improvement of his skin lesion with some postinflammatory hypopigmentation.

Conclusion: The accurate diagnosis of severe cutaneous adverse drug reaction is crucial and multiple drug allergy is not uncommon. Systemic corticosteroid is a treatment of choice and gradual tapering off required to prevent relapse or worsening of symptoms.
WAC23-0213
Phenotypes and Endotypes of Rituximab Immediate Hypersensitivity Reactions

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Background: Rituximab (RTX) is reported to cause an immediate hypersensitivity reaction (HSRs) involving multiple phenotypes and endotypes. We aim to clarify patients' clinical phenotype and endotype of RTX HSRs.

Methods: A prospective study as part of a pharmacovigilance program was conducted from July 2020 to December 2021. Participants who experienced RTX immediate HSR were recruited, skin tests, basophil activation test, IFN-γ ELISpot and IgG anti-drug antibody (ADA) ELISA assay, were performed.

Result: The prevalence of the immediate HSRs to RTX was 2.67%. Participants with history of switching the biologic agents from one RTX biosimilar to another had a higher frequency of hypersensitivity reaction than the non-transition drug group, P = 0.001. Infusion-related reactions (IRRs) were the most common immediate reactions found in 52.94%, in which reactions onset occurred in the first cycle of RTX administration, and the clinical presentations were mild to moderate in the severity of anaphylaxis grading. In the RTX HSRs group, Type I (IgE/IgG) and mixed reactions (Type I/CRS) were diagnosed in 2/8 (25%) of each group. However, in 4/8 (50%) of patients the reaction could not be classified. Two of 8 (25%) patients had positive results on skin tests to RTX (IgE-mediated), serum tryptase and ADA ELISA (IgG-mediated). Basophil activation tests were all negative.

Conclusion: RTX immediate HSRs had multiple phenotypes and endotypes. IRRs are the most common in the first cycle of RTX administration. Anti-drug antibodies, skin testing to RTX, and IL-6 level are valuable investigations to identify the endotypes in RTX HSRs.
WAC23-0216
Pre and post COVID-19: Eight-year longitudinal analysis of the first 1000 immunology and allergy cases

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Background: The first territory wide public adult clinical immunology and allergy (IA) team in Hong Kong was officially established in 2018 at Queen Mary Hospital. In early 2020, the city had its first outbreak of COVID-19, disrupting clinical service and care for IA patients. The objective of this study is to review the burden of cases at our centre before and after the COVID19 outbreak and identify changing service needs and demands.

Methods: The first 1000 adult patients seen at our clinic were recruited into the study. Cases that did not fall under the category of allergy or immunology were excluded. Patients were categorized into two groups, “pre-COVID19” and “postCOVID19”. Clinical data were compared between these two cohorts.

Result: Of the 1000 cases referred our centre, 98.2% were included in this study, of which 519/982 (53%) were allergy and 463/982 (47%) were immunology cases. There were significantly more allergy cases referred to us in the post-COVID19 cohort compared to pre-COVID19 [104/231 (45%) vs. 415/751 (55%), respectively (p=0.006)]. Among the allergy cases, there was a significant 8% increase in drug allergy cases seen after the outbreak of COVID19 (23% pre-COVID19 vs. 31% post-COVID19; p=0.019). The most common drug allergy label was antibiotics (124/290, 42.8%). On the contrary, there were significantly fewer immunology cases pre-COVID (127/231, 55%) compared with post-COVID (336/751, 45%), p=0.006.

Conclusion: After COVID-19, there was a shift in referral trends towards allergy cases, especially drug allergy. Focus should be placed on implementing safe and effective protocols to alleviate the burden of allergy cases at a tertiary level.
A Two-day Desensitization Protocol for L-asparaginase in a Child with Acute Lymphoblastic Leukemia

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Background: A 2-year-old boy with high-risk B-cell lymphoblastic leukemia (B-ALL) who developed anaphylaxis caused by L-asparaginase (L-Asp).

Case study: A 2-year-old boy with high-risk B-ALL experienced anaphylaxis with symptoms of angioedema, urticaria, and diarrhea 55 minutes following his 7th L-Asp infusion. As L-asp is crucial for his chemotherapy, we conducted a 2-day desensitization protocol which spanned 6 hours on the first day and 5 hours on the second. Single doses of intravenous hydrocortisone (5mg/kg), chlorpheniramine (0.25 mg/kg), and oral famotidine (0.5mg/kg) were administered 30 minutes before desensitization as pre-medications. On the initial day with a 15-step desensitization, L-asp was divided into 3 bags with different concentrations and volumes: 0.2%, 1.8%, and the remaining 98% of the total dose 7,500 IU. The L-asp intravenous infusion began at 4 ml/hr and was titrated up to 200 ml/hr. On Day 2, we performed a 7-step desensitization with a maximum rate of 60 ml/hr with total dose 7,500 IU, following the pre-medications. After finishing L-Asp administration, he immediately developed small urticaria on his face. Intravenous chlorpheniramine was given, resulting in the resolution of symptoms. During the 8th L-Asp infusion, we performed a 2-day desensitization protocol again, which proceeded without any adverse reactions.

Conclusion: Our study shows that a 2-day desensitization protocol can be safely performed without encountering any complications.
WAC23-0234
Antiepileptic medication-induced severe cutaneous adverse reactions in hospitalized children: A five-year study in a tertiary referral center

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Background: There is limited data on severe cutaneous adverse reactions (SCAR) associated with antiepileptic medication. The current study aims to investigate clinicoepidemiological characteristics of antiepileptic medication-induced SCAR in hospitalized children.

Methods: This retrospective study at Isfahan University of Medical Sciences, Iran covers five years. All children with a definite diagnosis of SCARs based on the WHO definition secondary to the use of antiepileptic medication were included in the study. In our study SCARs were categorized in three fields: Hypersensitivity syndrome, drug reaction with eosinophilia and systemic symptoms (DRESS), Stevens-Johnson syndrome (SJS)/toxic epidermal necrolysis (TEN)

Result: From 259 children with diagnosed SCAR related to the anticonvulsant medications, 199 (76.83%), 42 (16.22%), and 18 (6.95%) had hypersensitivity syndrome, DRESS, and SJS/TEN, respectively. Phenobarbital was the most common offending drug in all types of SCARs. The multinomial logistic regression model demonstrated that lymphadenopathy increased the risk of DRESS by 35 times in comparison to hypersensitivity syndrome (P<0.001). Girls were at risk of SJS/TEN by approximately 6 times in comparison to boys (P=0.027). Age (P=0.021), weight (P=0.036), and mucosal involvement (P<0.001) affect the duration of hospitalization in children with SCARs related to the Antiepileptic medication

Conclusion: There are some similarities and differences in the clinicoepidemiological features of antiepileptic medication-induced severe cutaneous adverse reactions in hospitalized children in Iran.
WAC23-0239

Facial fixed drug eruption to dimenhydrinate

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Background: Fixed drug eruption (FDE) is an uncommon adverse cutaneous reaction characterized by localized erythema and occasionally vesicles that recur at the same site with each exposure to a particular medication. While FDE is welldocumented, reports of its occurrence in response to dimenhydrinate are limited, particularly involving the facial area.

Case study: A male in his 20s, with allergic rhinoconjunctivitis and a previous delayed cutaneous reaction to trimethoprim-sulfamethoxazole, presented with a recurring facial rash and vesicles after consuming oral dimenhydrinate. The rash’s onset was delayed (initially over 12 hours), but subsequent exposures led to a more rapid manifestation. Given that there are many differential diagnoses for facial rashes and that the patient wished to use dimenhydrinate as an anti-emetic, an oral challenge was pursued to demonstrate the reproducibility of his reaction. An oral challenge to 50 mg of dimenhydrinate produced a pruritic rash on his right cheek after 1.5 hours, resolving within 4 days with the use of topical tacrolimus. The patient was instructed to avoid dimenhydrinate. Patch testing was discussed with a dermatologist, though this was not pursued due to the possibility of a poor cosmetic outcome on the face.

Conclusion: The patient's case highlights FDE, a rare manifestation of drug allergy, in response to dimenhydrinate, a widelyused anti-emetic. This case contributes to the limited body of knowledge on dimenhydrinate-induced FDE, particularly when involving the facial region. The importance of considering uncommon drug reactions, conducting appropriate challenges for accurate diagnoses, and providing targeted treatment is underscored.
Allergen analysis of anaphylaxis caused by influenza vaccines

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Background: Anaphylaxis is a rare, potentially life-threatening hypersensitivity reaction following vaccination. The most reported vaccines associated with anaphylaxis were inactivated influenza vaccines (IIVs). We previously demonstrated that the major culprit allergens related to anaphylaxis in IIVs were the vaccine proteins, not contaminated chicken egg protein or any other additives. However, we also observed a high prevalence of IIV-specific IgE antibodies (sIgE) in safely vaccinated children. This prompted us to characterize IgE-binding proteins involved in inducing allergic symptoms.

Methods: Subjects were 8 patients with anaphylaxis or immediate allergic reaction following influenza vaccination. Vaccine-induced basophil activation test (BAT) was performed by CD203c expression and IIV-sIgE was measured with the ImmunoCAP system. Vaccine proteins from H1N1, H3N2, B/Yamagata, and B/Victoria strains were subjected to two-dimensional electrophoresis. IgE-binding proteins were identified by immunoblotting with sera from the patients and mass spectrometry.

Result: All the subjects exhibited positive BAT and IIV-sIgE. Immunoblotting demonstrated various IgE binding proteins of 10-50kDa. Mass spectrometry identified matrix protein 1 (M1) as a common IgE-binding protein among all subjects. The homology within the same type was about 99% and about 29% between the different types. IgE-binding to nucleoprotein (NP), hemagglutinin (HA), and neuraminidase (NA) differed in individual patients.

Conclusion: M1 is a common allergen in IIVs. Differential reactivities to NP, HA, and NA suggest that IgE sensitization patterns vary among patients. M1 is common across virus subtypes and may be a candidate protein to be modified in future universally safe vaccines.
WAC23-0285
Drug allergy presentation at a specialized allergy clinic in Sri Lanka

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Background: Globally drug allergy accounts for about 4-10% of allergy cases and was reported as a leading cause of anaphylaxis among adults in Sri Lanka. Studies show that in the Asia-Pacific region there are disparities in its management leading to incorrect labelling.

Methods: 96 patients with unclassified drug allergies were assessed at our clinic. All information regarding the episode was evaluated by a Consultant Immunologist. Skin Prick Test (SPT) was done in eligible patients.

Result: Of the 96 patients, 76 (79.2%) were adults and 69 (71.9%) were female. 56 (58.3%) reported an episode of anaphylaxis. Of the 44 (45.8%) patients who presented with a suspected single drug allergy the most implicated drugs were beta lactams 12 (27.3%), non steroidal anti inflammatory drugs (NSAIDs) 8 (18.2%) and macrolides 5 (11.4%). 52 (54.2%) patients presented being labelled as having multiple drug allergies as the reaction occurred when multiple medication was consumed together. Among them the most implicated were NSAIDs 37 (71.2%), beta lactams 26 (50%) and paracetamol 17 (32.7%). SPT was done in 90 patients and gave a positive response in only 32 (35.5%). Among them beta lactams 12 (13.3%), NSAIDs 7 (7.7%) and paracetamol 6 (6.6%) were the most commonly positive drugs. 7 (7.7%) patients had multiple drugs positive by SPT.

Conclusion: Beta lactams and NSAIDs are the most common drug allergies in Sri Lanka and as a low resource setting there are no standardized protocols for its management. Therefore, it is important that protocols are implemented to reduce incorrect labelling of patients.
Drug-induced enterocolitis syndrome (DIES) due to amoxicillin in a pediatric patient with tolerance to penicillin.

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**Background:** DIES is a rare, non-IgE mediated drug allergy, causing gastrointestinal symptoms, which can lead to a shock. Few cases have been reported in children, mostly due to amoxicillin. Avoidance of the whole pharmacological drug group related to the culprit drug is usually the first recommendation, as mechanisms involved are still unknown. Nevertheless, it is important to investigate tolerance to related drugs to offer a safe alternative treatment to these patients.

**Case study:** We present a 4 year-old male patient who referred 3 episodes of multiple vomiting (one of them with diarrhea) and weakness, 60-90 minutes after the first dose of amoxicillin or amoxicillin-clavulanic acid. Skin prick test and intradermal test to PPL, MDM, amoxicillin-clavulanic acid were performed, with negative results. Oral challenge with amoxicillinclavulanic was performed in two doses of 50 mg and 500 mg. 90 minutes after the last dose, he presented with abdominal pain, nausea, vomiting and weakness, with no change on vital signs. No changes in tryptase levels were observed. Paracetamol, ondansetron, and fluid replacement therapy were administered, with a complete recovery within the 2 following hours. Five months later, oral challenge with phenoxymethylpenicillin was performed in two doses of 25 mg and 225 mg, confirming tolerance.

**Conclusion:** We present a DIES due to amoxicillin-clavunanic acid in a pediatric patient with tolerance to penicillin. When amoxicillin is the culprit drug involve in DIES, we suggest checking tolerance to penicillin, as avoiding all Beta-Lactams could represent an important therapeutic limitation in the future.
WAC23-0298
SKIN TEST RESULTS IN PATIENTS SUSPECTED TO BE ALLERGIC TO CHEMOTHERAPY DRUGS

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Background: Chemotherapeutic drugs have been widely used in the treatment of cancer disease since 1940s. However, all chemotherapeutic agents can induce hypersensitivity reactions (HSRs), with different incidences depending on the culprit drug. The most common and severe reactions are thought to be IgE mediated. Currently, skin testing is the only method used clinically to identify individuals sensitized to chemotherapy agent. Our study aims to evaluate the reliability of skin tests in the detection of patients at risk of developing HSRs

Methods: Patients with a history allergy disease or allergy drug to chemotherapeutic agents were performed skin prick test and intradermal test with the indicated chemotherapeutic agents

Result: Among the 82 patients evaluated, 43 (53.1%) experienced HSRs to at least one chemotherapy agent. Thirty-nine of the 43 HSRs were classified as immediate and four delayed. Skin tests confirmed an IgE-dependent mechanism in 40% patients with immediate-HSRs to oxaliplatin, 25% Docetaxel, 9.1% carboplatin, 50% Doxorubicin. Paclitaxel and cisplatin were 100% negative for skin tests

Conclusion: Based on our findings, skin test for platinum agents is a simple and sensitive tool for the diagnosis and prevention of HSRs to chemotherapy drugs
WAC23-0299

Allergic Transfusion Reactions in Pediatric Patients: A Descriptive Study

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Background: Allergic transfusion reactions (ATRs) are defined any blood transfusion-related event that occurs during or after blood product administration. ATRs are more frequently presents in pediatrics than adults and may cause life threatening. Therefore, it is critically important to investigating the profile of pediatric ATRs. This study aimed to determine some factors of ATRs in pediatric patients in a tertiary hospital in Makassar, Indonesia.

Methods: This was a descriptive study with a total sampling method. We conducted a retrospective review of all episodes of ATRs in pediatric patients (<18 years old) who hospitalized at Department of Child Health in a tertiary hospital, Wahidin Sudirohusodo Hospital in Makassar, Indonesia, from January to December 2022. The investigated variables were age, gender, type of blood products, and clinical diagnosis.

Result: There were 128 ATRs episodes involving 89 pediatric patients. Twenty of 89 patients (22%) had repeated reactions. Thrombocyte concentrate (TC) was the most frequently associated to ATRs incidents (82,81%), followed by packed red cells (PRC) (12,5%) and combination of TC and PRC (4,69%). Regarding age group, gender, and clinical diagnosis, majority of ATRs episodes was found in males (52%), 1 – 5 years old (34,83%), and Leukemia (46,09%), respectively.

Conclusion: In conclusion, this information is essential to inform risk factors of ATRs in pediatric patients. Further characterization and investigation the role of the factors in relation to ATRs are required.
WAC23-0307
UTILITY OF BASOPHIL ACTIVATION TEST IN THE DIAGNOSIS OF CROSS INTOLERANCE NSAIDS REACTIONS

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Background: Almost cases with suspicion of cross intolerance to non-steroidal anti-inflammatory drugs (NSAIDs) have required drug challenge test. Therefore, a non-invasive test such as basophil activation test (BAT) can be a useful tool for safer diagnostic procedures. The aim of this study was to assess the utility of BAT in the diagnosis of NSAIDs non-selective hypersensitivity reactions.

Methods: A case-control study was conducted on 30 patients with the diagnosis of NSAIDs induced cross-intolerance patients and 32 healthy volunteers in Vinmec healthcare system. Case patients were confirmed by clinical history with or without drug provocation test. The BAT test was performed for both groups with 2 different concentrations of 2 NSAIDs including Lysin-Aspirin 1.25mg/ml, Lysin-Aspirin 0.5mg/ml, ketorolac 1.25mg/ml, ketorolac 0.5mg/ml and negative control. Basophil was considered as activated when it shows upregulation of both CD63 and CD203. Cut-off for raw percent activated basophil and SI (stimulation index) using ROC curves were analyzed to each concentration find the optimal sensitivity and specificity.

Result: The BAT test with Lys-Aspirin at 1.25 mg/ml showed the highest diagnostic value with sensitivity of 60% and Specificity of 94% when a positive test result was determined with raw percent activated basophil > 4% and SI >1.5.

Conclusion: BAT can be a potential assay to diagnose NSAIDs induced non-immunological reactions. With high sensitivity, BAT can help to defer the need for a drug provocation test, preventing potential severe, especially anaphylactic reactions.
Background: Fixed drug eruption (FDE) refers to the development of annular erythematous skin patches which may blister as a result of systemic exposure to certain drugs and foods. The lesions heal with hyperpigmentation and recur at the same site with re-exposure. Causative drugs include antibiotics, non-steroidal anti-inflammatories, anticonvulsants etc. Foods commonly implicated include cashews and tartrazine. Carbamazepine-induced reactions can occur in up to 10% of patients, and typically affect the skin. Most reactions are mild, however, conditions such as Stevens–Johnson syndrome (SJS), toxic epidermal necrolysis (TEN), and drug reaction with eosinophilia and systemic symptoms (DRESS) are potentially lifethreatening.

Case study: A 35 year old retroviral disease (RVD) reactive male on antiretroviral therapy (ART) and suppressed viral load with a CD4 count of 360 presented with a week history of hyperpigmented annular patches. The lesions started three weeks after ingestion of carbamazepine given for post-herpetic neuralgia. Skin examination revealed annular hyperpigmented patches on the arms and trunk. He also had a healed herpes zoster scar on his lower back. A skin biopsy was not done and a clinical diagnosis of carbamazepine-induced fixed drug eruption was made. The patient was treated with topical steroids and oral antihistamines and the carbamazepine was discontinued.

Conclusion: We present a case of fixed drug eruption in an immunocompromised patient with post-herpetic neuralgia. This case demonstrates the need to avoid the use of anticonvulsants in neuropathic pain, as there is a significant chance of developing drug reactions which could be life-threatening like toxic epidermal necrolysis.
Sensitization to Api m 1, Api m 2, and Api m 4 in Japanese beekeepers who had experienced systemic reactions to honeybee stings

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Background: The major allergen components of honeybee (HB) venom are phospholipase A2 (Api m 1), hyaluronidase (Api m 2), and melittin (Api m 4). IgE antibodies specific(s) to phospholipase A2, hyaluronidase, and melittin bind to recombinant (r)Api m 1, rApi m 2, and rApi m 4, respectively, and show increased test specificity due to the lack of carbohydrate determinants in the recombinant protein. However, the significance of measuring the levels of sIgE to these allergen components is not known. In this study, we analyzed sensitization to Api m 1, Api m 2, and Api m 4 in Japanese beekeepers who had experienced systemic reactions (SRs) to HB stings.

Methods: The participants comprised 121 beekeepers in Japan. Of the beekeepers, 34 who had experienced an SR to a HB sting were analyzed in this study. All participants underwent a medical examination including an interview with an allergist and peripheral blood tests were performed on the day of the examination.

Result: sIgE positivity to HB venom, rApi m 1, rApi m 2, and sApi m 4 was identified in 32 (94.1%), 31 (91.2%), 33 (97.1%), and 18 (52.9%) beekeepers, respectively. Double positivity to rApi m 1 and rApi m 2 was found in 30 individuals (88.3%). The combination of rApi m 1 and rApi m 2 resulted in the sensitivity increasing from 94.1% (32/34) to 100% (34/34).

Conclusion: Combination measurement of sIgE to rApi m 1 and rApi m 2 may improve the sensitivity for HB venom allergy detection.
Case report: Coronavirus disease -19 (COVID-19) in T-/B-/NK- Severe Combined Immunodeficiency (SCID) patient

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Background: Adenosine Deaminase deficiency (ADA) is an autosomal recessive disorder that typically results in Severe Combined Immunodeficiency (SCID) leading to life threatening infections including COVID-19. T cells play an important role in antiviral immunity however the role of innate and adaptive immunity in COVID-19 remains poorly understood.

Case study: We describe a 32-year-old female with T-/B-/NK- SCID due to ADA deficiency with persistently high SARS-CoV-2RNA concentrations in respiratory samples over 72 days. Our patient developed a dry cough in November 2022. Induced sputum samples showed no bacterial, mycobacterial, or fungal growth. Given her immunocompromised status a CT chest was obtained which showed left lower lobe airway disease. She subsequently had a positive SARS-CoV-2 RNA rapid antigen testing (RAT) at home on March 27th, 2023. Over a month after, her SARS-CoV-2 RNA PCR was positive with cycle threshold (CT) value of 17 indicating active infectious status. She was treated as an outpatient with intravenous Remdesivir for a total of 10 days with resolution of her symptoms. She was maintained on her monthly immunoglobulin replacement therapy, enzyme replacement (Revcovi) and prophylactic antibiotics. Despite that, her SARS-CoV-2 RNA PCR remained positive with high CT value (13-16). She was started on Paxlovid where eventually viral clearance was detected by day 20 of Paxlovid.

Conclusion: In summary, the lack of T cells, NK cells, and functional B cells in our patient did not lead to severe respiratory compromise typical of COVID-19 disease, but instead was associated with persistent high viral concentrations in respiratory samples over 72 days.
Two Red Fluorescent Proteins (Akane and DsRed-Express) correspond to the Allergic Protein which cause allergic disease

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Background: It was found the octocoral Scleronephthya gracillima, which causes the allergic disease in fishermen (R1). Farther the same octocoral was characterized as a new red fluorescent protein (RFP) named Akane (R2). The purpose of this research is to clarify the relationship of the allergenic protein and the RFP of the recombinant Akane. Further, does DsRedExpress (which is) another RFP from coral has allergenic protein or not?

Methods: SDS-PAGE, western blotting, ECL method were performed using serum from allergic patients of fishermen and healthy volunteers. The fluorescence of the two RFPs was measured by a fluorophotometer.

Result: This is the first report of the new allergenic protein r-Akane had a molecular mass of 27 kDa, which corresponds to the new red fluorescence protein, r-Akane, showing fluorescent emissions in the red (640) nm and green (513) nm. Farther the 27 kDa component was determined to be an allergen by western blotting, ECL immune staining method using IgE binding capacity of recombinant-Akane (r-Akane), also DsRed-Express reacted ECL immune staining in allergic patient serum of fishermen.

Conclusion: Amino acid sequences of DsRed-Express protein and r-Akane protein are highly homologous. Further DsRedExpress protein and r-Akane showed immunoglobulin-binding epitopes with serum from patients allergic of fishermen by western blotting and ELISA method. Two red fluorescent protein, r-Akane and DsRed-Express correspond to the Allergic Protein which cause allergic disease. The study protocol conformed to the standards set by the Declaration of H
Outcomes of Bee Sting Injuries in a Community Hospital in Northern Thailand

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Background: Bee sting reactions can be severe and potentially life-threatening. The prevalence of bee sting reactions varies between geographic locations. Pa-Sang district, Lamphun province is one of the largest apicultural areas in Thailand.

Methods: We performed a retrospective review, based on ICD-10 electronic medical records of patients who attended the Emergency Departments (ED) at Pa-Sang hospital due to bee sting injuries from January 2015 to December 2019.

Result: A total of 591 events of bee sting in 533 patients were analyzed. Fifty-five percent of patients were male. Most of the events (86%) occurred outside their home area. Head or extremities (49%) was the most common part of the body that was stung. Forty-four percent of them presented with systemic reactions and 96 visits (16%) were diagnosed with anaphylaxis. Adrenaline injection was administered in 77% of them. No fatal anaphylactic reaction was recorded. The age less than 15 years old and sting area at extremities were the protective factor of anaphylactic reactions after bee sting, while more than 10 bee stings, and time lapse between stung and ED visiting within 60 minutes were the significant risk factor.

Conclusion: Bee sting injuries were frequent presentations at the hospital located in the high apicultural area. The severe systemic reactions due to bee stings were not uncommon.
WAC23-0252
Multiomics-based prediction for allergic march endotypes from childhood allergic disease

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Background: Allergic march is a sequential progression from atopic dermatitis (AD) to asthma. Although efforts for allergic march diagnosis have focused on clinical evidence, an approach to biomarkers will be helpful in a prediction of allergic march. We investigated the biomarkers involved in multiomics-based biological distinctions among AD, asthma, and allergic march and assessed a predictive model with combinations of their signals.

Methods: Omics features involved in the biological functions differentiating allergic diseases were included in dataset. Support vector machine binary classification model for two diseases was used to select potential biomarkers. Multi-class classification model with 2~6 biomarkers was applied to assess the model performance.

Result: Four endotypes were identified in previous study; endotype 1 (more AD); endotype 2 (more asthma), endotype 3 (more allergic march), and endotype 4 (more healthful). Otopetrin 2 (OTOP2) and alpha-2-macroglobulin (A2M) for AD vs asthma, phosphatidylinositol-4,5-bisphosphate 3-kinase catalytic subunit alpha (PIK3CA) and selectin L (SELL) for AD vs allergic march, and microsomal glutathione S-transferase 3 (MGST3) and coagulation factor XIII b chain (F13B) for asthma vs allergic march showed a good performance. The combination sets of A2M, SELL, and MGST3 or F13B showed the best performance with cost-effectiveness in a prediction of allergic march (AD vs asthma vs allergic march, AUC = 0.98).

Conclusion: Combinations of A2M, SELL, and MGST3 or F13B may be prognostic markers for the prediction of allergic march.
Excipients as cause of drug and vaccine hypersensitivity reactions

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Background: Excipients are widely used in pharmaceuticals, detergents, personal care products, food and drink because of low toxicity and hypoallergenicity. IgE mediated allergies by excipients are rare, while non IgE mediated reactions or intolerance may be far more common. Immediate hypersensitivity (IHRs) to excipients has been increasingly reported, by suspected IgE, non IgE, or complement mediated mechanism, known as C activation-related pseudoallergy (CARPA), with varying levels of supportive mechanistic evidence. The wide family of polyethylene glycols (PEGs) are polyether compounds derived from ethylene oxide with broad use as excipients and conjugated in drug, vaccines and other products. Polysorbates (PSs) are structurally similar to PEGs and are used in medicines for their similar pharmaceutical properties.

Case study: We identify a case of severe anaphylaxis in a 33-year-old Caucasian woman after receiving first dose of Amgevita (adalimumab) for ankylosing spondylitis. One year prior to presentation, she had an anaphylactic reaction after the second dose of COVID-19 vaccine. Previously, she reported a metallic sensation in the throat after the first dose. Upon further review of her history, she described another SA episode 4 years ago, 3 hours after a sesame superfood bar consumption (she eats sesame and all the main ingredients of the bar). Finally, she reported contact allergy to metals and personal care products. Allergic investigation proved excipient allergy (PEGs and PSs).

Conclusion: This case highlights the importance of identifying excipients such as PEGs and PSs as causes of allergy, to reduce burden of further hypersensitivity reactions, not only to drugs but to other consumables.
Early Diagnosis of Autosomal Recessive Chronic Granulomatous Disease Beyond Genetic Panels: A Case Report

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Background: Chronic granulomatous disease (CGD) is caused by defects in genes encoding NADPH oxidase enzyme complex, resulted in diminished function of phagocytic respiratory burst. A mutation of NCF1 gene with abnormal expression of p47phox protein is the second most common subtype. We herein present the case of autosomal recessive CGD with NCF1 pseudogenes.

Case study: A term male newborn presented with respiratory distress and was treated for congenital pneumonia with little improvement after 10 days of intravenous antibiotics. Chest computed tomography at 1 month old showed multiple roundshaped pulmonary consolidations scattered in both lungs and bronchoscopy revealed cytomegalovirus pneumonitis without anatomical defect. Despite the appropriate treatments, the right lower lung consolidation had progressed into an abscess at 2 months old. Initial immunological evaluations for lymphocyte enumeration and immunoglobulin levels were within normal range. Dihydrorhodamine-123 (DHR) assay demonstrated an abnormal histogram compatible with autosomal recessive CGD. The gene panel testing of the primary immunodeficiency identified a heterozygous mutation of the MYSM1 gene but did not correlate with the clinical presentation of this patient. However, Western blot analysis has proved the loss of p47phox protein and PCR-restriction fragment length polymorphism (RFLP) has been sent to confirm the defect of NCF1 pseudogenes. The patient is currently receiving antimicrobial and antifungal prophylaxis, and preparing for hematopoietic stem cell transplantation.

Conclusion: Gene panel testings sometimes have limitations in detecting certain variant of CGD and other investigations should also be considered in patients with clinical suspicion.
Primary Immunodeficiency and Autoimmunity in NFkB2 Gene Mutation

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Background: NFkB2 gene encodes a subunit of the transcription factor complex NFkB. NF-kB pathway signaling serves a critical role in immunoregulation and mutations in genes encoding NF-kB have been associated with primary immunodeficiency and autoimmunity. Heterozygous mutations in NFKB2 have recently been established as a genetic cause of CVID and DAVID syndrome. Here, we describe a patient with a unique C-terminal truncating mutation and with immunodeficiency and autoimmunity.

Case study: An 8-year-old Hispanic female was admitted for recurrent thumb and index finger infection due to HSV. She has had multiple upper respiratory infections and otitis media since age of 2; alopecia totalis around age of 3. At age of 8, she developed Sicca syndrome with dry eyes and mouth. Immunological tests revealed mildly low IgG (644), elevated IgA, and normal IgM. Repeat testing showed normal IgG/M and elevated IgA. Lymphocyte enumeration showed low CD19 B cells count, elevated CD4 T cells and normal CD8 T cells/NK cells. Dtap titers are non-protective despite re-vaccination. Strep Pneumonia titers improved to protective level after re-vaccination. Genetic testing revealed NFKB2 c.2596_2597del (p.Ser866Cysfs*19) heterozygous mutation. Parental samples did not reveal NFKB2 gene mutation. This change creates a premature translational stop signal in NFKB2 gene, which disrupts the last 35 amino acids of the NFKB2 protein. Variation at this position has been previously identified in two other patients in medical literature, however, with different clinical presentations and outcome.

Conclusion: Heterozygous mutations in NFkB2 represent an early onset, distinct primary immunodeficiency that presents broader spectrum than usual clinical spectrum of CVID.
Azathioprine for Maintenance of Remission in Anti-Interferon-γ Autoantibody-Associated Immunodeficiency Syndrome

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**Background:** Anti-interferon-γ autoantibodies (Anti-IFN-γ Aab) disease is associated with frequent recurrent infections and a chronic clinical course. Adjunctive immunosuppressive treatment, including Rituximab and intravenous cyclophosphamide (IVCY), can achieve disease remission. However, relapse/recurrent infection after discontinuing immunosuppressive drugs had been reported. Azathioprine is an anti-proliferative drug used as maintenance therapy in many autoimmune diseases, demonstrating clinical effectiveness and fewer adverse effects.

**Methods:** A retrospective observational study was conducted at the tertiary center of Ramathibodi Hospital from February 2021 to April 2023 in patients with Anti-IFN-γ Aab who were prescribed azathioprine as maintenance therapy.

**Result:** Sixteen Anti-IFN-γ Aab patients, with 10 out of 16 female patients (62.5%), were recruited. The average age at disease onset was 52.38 (+8.91) years. The mean duration from diagnosis of Anti-IFN-γ Aab was 5.53 (+1.78) years, and the median number of relapse/recurrent infections was 2.5 episodes (IQR 1.5-3.5). Nontuberculous mycobacterial infection (NTM) was the most common opportunistic infection found in 13/16 patients (81.25%). Azathioprine was prescribed, average dose of 0.85 (+0.13) mg/kg/day, as maintenance therapy after achieving disease remission and discontinuing adjunctive treatment with Rituximab and IVCY. The median duration of maintaining remission (IQR) was 456.5 (290-638.5) days at the end of the study. The decrease of Anti-IFN-γ Aab titer was documented. No adverse effects were reported.

**Conclusion:** The study is the first to demonstrate the promising outcome of azathioprine as maintenance therapy in patients with Anti-IFN-γ Aab.
WAC23-0162
Clinical presentation of autosomal recessive agammaglobulinemia: A case report

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Background: TRNT1 deficiency is a rare form of agammaglobulinemia with highly variable clinical features among patients. To report a case of TRNT1 deficiency presenting with early onset agammaglobulinemia.

Case study: A 1-month-old Thai female presented with fever, septic shock and right cheek abscess. She was diagnosed with urinary tract infection from Escherichia Coli and Clostidium difficile mucous bloody diarrhea. Further investigations revealed anemia, low lymphocyte count and significant decreases in B cell numbers and immunoglobulin levels but normal lymphocyte proliferation response to PHA. Anti-HIV was negative. She was diagnosed with agammaglobulinemia and started on intravenous immunoglobulin (IVIG) therapy administered every 3-4 weeks, along with antibiotics for infections. Despite IVIG therapy, she developed recurrent perianal abscesses and rectovaginal fistula, needed sigmoid colostomy and recurrent fever and urinary tract infection despite prophylactic trimethoprim. At the age of 3.5 years, whole-exome sequencing identified novel heterozygous TRNT1 mutations (c.322C>G and c.1172A>G) on chromosome 3. These mutations occurred in a highly conserved gene region, close to a previously reported Japanese case. Consequently, she received diagnosed with agammaglobulinemia with TRNT1 mutation. While receiving ongoing treatment, she continued to experience recurrent diarrhea with hematochezia, leading to the diagnosis of Crohn’s disease at 4 years and 10 months of age. Tragically, around the age of 5, she suffered massive bleeding via colostomy and passed away. Additionally, she exhibited global developmental delay throughout her clinical course.

Conclusion: TRNT1 deficiency should be considered in patients with atypical agammaglobulinemia, early onset, developmental delay, anemia, and inflammatory bowel diseases.
WAC23-0195

STAT 1 gain-of-function mutation with chronic mucocutaneous candidiasis: case report of a 2-year-old Thai girl

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Background: Chronic mucocutaneous candidiasis (CMC) is a primary immunodeficiency disease caused by various gene mutation resulting in recurrent or persistent non-invasive candida infection of the mucocutaneous system, e.g., skin, nails, and mucosa.

Case study: This case report presents a 2-year-old girl with well demarcated faint erythematous annular patches and plaques with slightly raised border at face, neck and perianal area for 1 year. Despite receiving topical antifungal treatment, there was only partial improvement. Subsequently, she was referred to our hospital with newly developed whitish patches on her lips, buccal mucosa, and tongue, with an extension of the previous skin lesions. Potassium hydroxide examination and culture from tongue, face, neck and perianal area confirmed Candida albicans. Her thyroid function showed high TSH, low FT4 and positive anti-thyroid peroxidase. CD marker and immunoglobulin level were normal. Other laboratory investigations for endocrinopathies were unremarkable. The STAT1 c.854A>G p.Gln 285Arg mutation was identified through whole-exome sequencing. This mutation had been previously described association with STAT1 GOF and CMC. She has one younger brother with no clinical of CMC. There was no recurrent infections in her family. She received oral fluconazole, nystatin, topical ketoconazole and thyroxine with well response. No other infections were reported currently.

Conclusion: STAT1 GOF mutation is autosomal dominant and leads to defective T helper 1 and 17 responses, resulting in increased susceptibility to candida infections. This condition is characterized by CMC. New mutations can occur in this inherited condition, even without a family history. Endocrinopathy abnormalities are common in STAT1 GOF.
Hyper-IgE syndrome with STAT 3 mutation: case report of a 13-year-old Thai boy

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Background: Hyper-IgE syndromes (HIES) are rare hereditary primary immune deficiency. It is characterized by elevated serum IgE, dermatitis, and recurrent skin and lung infections. While most cases of HIES are sporadic, some cases can be autosomal dominant or autosomal recessive patterns.

Case study: A 13-year-old boy presented with recurrent itchy eczematous and desquamating eruptions on the face, arms, and legs. By the age of six, he had developed multiple episodes of cellulitis and abscesses in his ears, scalp, arms, legs, and trunk. He was treated with antibiotics and drainage, which revealed culture-yielding Staphylococcus aureus. Since the antistaphylococcal prophylactic antibiotic was started last 2 years, the skin infection was improved. On physical examination, the characteristic facial appearance was noted, featuring rough facial skin with exaggerated pore size, a flat chest, and scattered rash scars on his skin. None of the parents and siblings shared similar complaints. The leukocyte count was 13,300 cells/L (57.5% neutrophils 28% lymphocytes, and 10.5% eosinophil). Serum immunoglobulin; IgE 9,980 mg/dl, IgG 1,200 mg/dl, IgM 129 mg/dl, and IgA 83.1 mg/dl. Mandible X-ray demonstrated retained primary teeth. A spine X-ray revealed mild scoliosis. The Hyper IgE score was 42. The genetic analysis showed a novel mutation in heterozygous STAT3 mutation in c.1721A>C (P.Lys 574 Thr).

Conclusion: HIES is a rare disease characterized by recurrent skin infections and eczematous dermatitis. Additional clinical manifestations seen in patients with STAT3 mutation include coarse facial features, delay of shedding of primary teeth, and scoliosis. Genetic testing can help to confirm the diagnosis.
WAC23-0222
Recurrent Infection with normal lymphocyte subset count and immunoglobulin levels: Should combined Immunodeficiency (CID) be considered?

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Background: Combined immunodeficiency (CID) classically presents with severe and recurrent infections. Genetic testing plays a vital role in identifying specific mutations responsible for the CID phenotype.

Case study: A 14-year-old Thai male presented with recurrent oral candidiasis with chronic diarrhea at 6 months old, recurrent sinopulmonary tract infections at 1 year old. Immunological investigation found normal lymphocyte subset count but low levels of immunoglobulin (IG) G, A, and M. He was then received regular IVIG for 2 years. Despite controlled of the severe bacterial infection, however during this time, he developed disseminated tuberculosis (skin, pulmonary, and nasal polyps). IVIG was discontinued and reevaluation of his immunological profile revealed normal lymphocyte subset count and levels of IGG. At 6 years old, he developed pneumonia and nasal polyps which Mycobacterium haemophilum was identified from nasal mass and gastric wash, he also developed chronic osteomyelitis due to Cryptococcus neoformans. Further immunological workup found normal dihydrorhodamine assay, IFN-γ receptor, IFN-γ autoantibody, and IL-12 receptor, but his lymphocyte showed no respond to specific antigen. He was then received regular IVIG until 12 years old and discontinued due to COVID-19 pandemic situation. Genetic testing found homozygous RELB gene mutation (c.214C>T (p.Gln72*)) which the same point mutation also identified in his father and mother (heterozygous RELB gene mutation).

Conclusion: RELB is a member of alternative pathway of NFκB activation. Homozygous mutation of the RELB gene resulting in CID with normal lymphocyte subset count and immunoglobulin level but poor specific antigen response. Regular IVIG administration may help to reduce severity and frequency of infection.
A fenocopy defect Anti-IL12p70 autoantibodies with super response to rituximab

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Background: Phenocopies of PIDs are rare diseases caused by a somatic mutation or autoantibodies against various cytokines producing clinical manifestations similar to monogenic PIDs.

Case study: A fourteen-year-old girl with a 2-year history of weight loss (21 kg) and multiple recurrent abscesses in limbs, lungs, and spleen, rib fracture, complicated recurrent pneumonia, pyelonephritis, osteomyelitis, and septic shock, without fever. She also developed pulmonary tuberculosis. She required many hospitalizations (1 per month) for abscesses and infections and oxygen supplementary, with a poor quality of life. Chest computed tomography revealed multiple bilateral bronchiectases. Laboratory workup reported chronic anemia, leukocytosis, neutrophilia, mild lymphopenia, thrombocytosis, hypergammaglobulinemia, and elevated acute serum reactants. Lymphocyte subsets were low but present. Mycobacterium tuberculosis was detected via polymerase chain reaction (PCR) in a bone biopsy specimen from ankle osteomyelitis. Wholeexome sequencing failed to identify a monogenic defect. IL-12 was found markedly elevated in serum from our patient. Phosphorylation of STAT4, induced by increasing doses of IL-12, was neutralized with serum from the patient, thus indirectly confirming the presence of anti-IL12 autoantibodies. She received intravenous immunoglobulin, with a good but short-lived response. After receiving rituximab and anti-mycobacterial antibiotics, the patient showed a spectacular response. She now lives a normal life after four years of follow-up.

Conclusion: A teenager girl patient with a Fenocopy Defect: anti -IL12 autoantibodies has a spectacular response to Rituximab.
A case report of a newborn with adenosine deaminase deficiency

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Background: Adenosine deaminase (ADA) deficiency is an autosomal recessive condition inherited through mutations in the ADA gene. The absence of ADA affects lymphocyte development and functioning, resulting in a severe combined immune deficiency (SCID).

Case study: A term Thai newborn born uneventfully, whose older sister and brother suffered from recurrent infection and passed away in early life. Despite the absence of consanguineous marriage, his parents reside in the same province and share the same last name. Genetic analysis identified mutation in exon 6 of ADA gene: heterozygous c.505T>C (p. Cys169Arg) in his mother and c.541G>T (p. Asp181Tyr) in his father. Reverse isolation was initiated after birth. On the third day of life, laboratory unveiled profound lymphopenia and hypogammaglobulinemia. A lymphocyte subgroup analysis indicated severe combined immunodeficiency, with low T, B and NK cells. Mutation analysis further identified a compound heterozygous missense variant; c505T>C (p. Cys169Arg) and c.541G>T (p. Asp181Tyr) in exon 6 of the ADA gene, which is the same location as his second sibling. Trimethoprim/sulfamethoxazole was administered for Pneumocystis jirovecii prophylaxis., HLA-matched related donor, from another older brother, hematopoietic stem cell transplantation (HSCT) was performed at 6 months old. Currently, he remains asymptomatic and does not require hospitalization thereafter, with an excellent outcome. Genetic counseling was provided to the family and his mother is under a contraceptive plan.

Conclusion: ADA deficiency is a medical emergency. Timely, reverse isolation and bacterial prophylaxis are essential to prevent recurring infections. HSCT is beneficial for patients with ADA deficiency.
WAC23-0246
Severe autoimmunity and T+B-NK+ immunodeficiency in a family with radiation sensitivity and small stature

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Background: We have identified a family in which 3 of 4 children are affected with significant autoimmunity and aspects of immunodeficiency.

Case study: The oldest affected child is a female with a history of intermittent but severe polyarticular arthritis (treated with Enbrel), eczema, diarrhea, and numerous infections including pneumonia and otitis media. She also has short stature with height and weight consistently below the 3rd percentile. She is s/p bone marrow transplant in July 2008 using a matched sibling donor, is fully engrafted and is doing well. The second affected child was also female and had numerous episodes of pneumonia, bronchiolitis, otitis media and conjunctivitis. She died at 11 months from presumed fulminant CMV hepatitis. The third affected child is a male with hypothyroidism, chronic diarrhea, alopecia totalis, eczema, reactive airway disease and failure to thrive with height and weight consistently at or below the 3rd percentile. All affected patients had normal CD4+ and CD8+ T cell numbers and normal NK cell numbers but were markedly B lymphopenic. High resolution T cell immunophenotyping demonstrated only a modest decrease in effector memory T cells. T cell proliferative responses were normal to mitogens

Conclusion: The overall clinical and laboratory picture of severe autoimmunity with a T+B-NK+ phenotype is somewhat unusual and does not fit any of the gene defects associated with radiation sensitivity in humans. Sequencing of the RAG1, RAG2, and Artemis genes, the most common defects associated with defective immunoglobulin gene rearrangement and a leaky SCID phenotype, was normal
WAC23-0251
Unveiling Cryptococcal Meningitis in a Non-Human Immunodeficiency Virus-Infected Patient: Exploring an Association with STAT3 Gain-of-Function Syndrome

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Background: Cryptococcal infections can manifest in non-human immunodeficiency virus-infected individuals (non-HIV) with underlying conditions such as diabetes or immunosuppressive drug use. Additionally, this infection can arise in the context of inborn errors of immunity (IEI) and autoimmune diseases. IEIs encompass a range of conditions including CD4 T-cell lymphopenia, GATA2 deficiency, IL12RB1 mutation, CD40L deficiency, and STAT3 loss-of-function mutation. Conversely, autoimmune diseases may involve autoantibodies against IFN-gamma and GM-CSF.

Case study: We report a 15-year-old male with an attention deficit hyperactivity disorder who presented with high-grade fever and altered consciousness. He was subsequently diagnosed with cryptococcal meningitis and cryptococcemia. Physical examination revealed facial dysmorphism and hepatosplenomegaly. HIV tests were negative. Laboratory analyses showed normal hemoglobin, white blood cells, and platelet counts. The differential count, lymphocyte subpopulations, and PHA stimulation were all within normal ranges. Both anti-IFN gamma and anti-GM-CSF were negative. Due to strong clinical suspicion, a primary immunodeficiency panel was obtained which revealed a variant of uncertain significance mutation within the STAT3 gene. This specific mutation, a Gain (Exons 5-14) with a copy number of 3, implies a potential STAT3 gain-of-function syndrome. Further investigations are sent to confirm this pathophysiology.

Conclusion: To our knowledge, this is the first case report where cryptococcal meningitis is suspected to be linked with a novel mutation in STAT3, potentially indicating a gain-of-function syndrome. However, the immune mechanisms remain unknown, prompting the necessity for further investigations.
WAC23-0265

Novel variant in ORAI1, an inherited channelopathy, causing severe combined immunodeficiency, autoimmunity, enamel hypoplasia, and hypotonia.

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Background: The ORAI1 encodes calcium release-activated channels, a principal pathway for calcium influx in T lymphocytes, which is essential for lymphocyte activation.

Case study: A 2-month-old male infant, born to consanguineous parents, presented with protracted watery diarrhea and persistent pneumonia. The physical examination revealed marked pallor and hepatosplenomegaly. The disseminated CMV infection and Coombs-positive AIHA were diagnosed. He did not respond to treatment with antiviral, intravenous immunoglobulins, and methylprednisolone. Lately, he developed enamel hypoplasia and hypotonia. Immunologic investigations revealed normal numbers of T, B, and NK lymphocytes; but decreased naïve B lymphocytes, transitional B lymphocytes, plasmablasts, and naïve CD4+ and naïve CD8+ T lymphocytes. Serum IgG, IgA, and IgM levels were elevated. Lymphocyte proliferation to phytohemagglutinin was markedly decreased. The Invitae Primary Immunodeficiency Panel revealed a homozygous novel ORAI1 variant in the patient, while both parents were heterozygous for this variant. Timelapse Ca2+ imaging confirmed that the patient’s T lymphocytes had impaired calcium influx, supporting the pathogenic roles of the ORAI1 variant.

Conclusion: The patient underwent haploidentical hematopoietic stem cell transplantation at 9 months. It temporarily engrafted before showing signs of graft failure. His parents refused the second transplantation. The patient passed away from disseminated CMV infection and myocarditis at 1 year of age.
Background: There is growing evidence that Toll-like receptor 4 (TLR4) is involved in shaping the T helper 2 (Th2) immune response to pollen allergenic sources, such as birch or mugwort. We sought to determine the role of TLR4 in allergy development in vivo using TLR4-KO and wild type (wt) mice. The aim of this study was to measure allergic sensitization induced by a birch pollen extract (BPE) in the absence of additional adjuvants.

Methods: TLR4-KO or wt Balb/c mice were immunized bi-weekly 4x subcutaneously with either BPE, Bet v 1, Bet v 1+Alum or PBS (n=6/group) and challenged on two consecutive days intranasally with Bet v 1 before performing an airway hyperresponsiveness (AHR) testing with methacholine challenge. Upon sacrifice, serum and bronchoalveolar lavage fluid (BALF) were collected for investigating the Bet v 1-specific humoral response (IgE, IgG1, and IgG2a) and lung immune cell phenotyping, respectively.

Result: Mice immunized with Bet v 1 or PBS did not show increased AHR whereas BPE led to elevated AHR in wt mice. The Bet v 1+Alum groups showed a significant response, which was accompanied by an influx of total leukocytes and eosinophils. In comparison to the Bet v 1+Alum groups, BPE immunization failed to induce Bet v 1-specific IgE and IgG1 in the KO mice whereas the opposite was observed in wt mice, indicative for a Th2-biased response.

Conclusion: These results imply, that BPE lacks the ability to sensitize TLR4-KO mice, making TLR4 a key player in driving Th2 responses to birch pollen.
Pharmacological characterization of T cell-induced bronchoconstriction

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Background: To investigate a role of helper T (Th) cells in asthma, T cell-transfer model was analyzed for late phase asthmatic responses. Culture supernatants of activated T cells were analyzed for the constriction of cultured bronchial smooth muscle cells.

Methods: Ovalbumin (OVA) specific Th clones were derived from either the splenocytes of DO11.10 transgenic mice expressing T cell receptor specific for OVA/H-2d. Th clones were adoptively transferred into unprimed mice. Upon antigen challenge, airway resistance was continuously monitored by either unrestrained whole body plethysmography (BUXCO) or resistance/compliance analyzer under anesthetized condition. Supernatants of stimulated Th clones were analyzed for contractile activity using collagen gels embedded with murine primary bronchial smooth muscle cells. Gel filtration and ion exchange chromatography were applied to further characterize the contractile activity produced by activated T cells. Neutralizing antibodies against several candidate molecules were tested in vitro.

Result: When unprimed mice were transferred with Th clones, T5-1, T6-2, T6-4, and T6-7, Penh values were significantly increased 6 hr after OVA challenge. In contrast, mice transferred with other Th clones, BF7, T6-1, or T6-10 did not show any change. Airflow limitation was confirmed by a direct measurement of airway resistance under anesthetized, restrained, and intubated conditions. Contractile activity was detected in the supernatants of T6-2 stimulated with immobilized anti-CD3. Distribution of molecular mass was delineated. Several recombinant molecules indicated in vitro activity.

Conclusion: T cell activation caused airflow limitation in addition to eosinophilic inflammation, AHR, and mucous hyperplasia. T cell-derived bronchoconstriction seems a good target for treatment-resistant asthma.
WAC23-0058
Functional analysis of phospholipase A2 mouse model of anaphylaxis

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Background: Major allergens of honey bees include the enzyme phospholipase A2 (PLA2) and the peptide melittin. To perform immunological analysis of the mechanism underlying allergen immunotherapy for honey bee venom allergy and the development of new treatments, it is necessary to create a mouse model of honey bee venom anaphylaxis. In this study, we created a PLA2 mouse model of anaphylaxis and analyzed its function.

Methods: Balb/c mice were subcutaneously sensitized four times with PLA2. Blood was collected on Day 28 and serum PLA2-specific IgE antibodies were analyzed by ELISA. On Day 35, rectal temperature was measured before and 15 min after subcutaneous challenge with PLA2, and blood histamine concentration was analyzed by ELISA after cardiac blood sampling. In addition, to analyze the Th1/Th2 balance on Day 35, the collected splenocytes were stimulated with PLA2, and the expression of mRNA was measured by real-time PCR.

Result: In the PLA2 mouse model of anaphylaxis, a significant increase in serum PLA2-specific IgE antibody was observed compared with the control group. There was a significant decrease in body temperature and an increase in histamine levels in the model mice compared with the controls. In addition, PLA2-specific IL-4, IL-5, and IL-13 mRNA were upregulated in the splenocytes of model mice compared with the controls.

Conclusion: Using the PLA2 mouse model of anaphylaxis established in this study, we would like to continue performing immunological analysis of the response mechanism underlying allergen immunotherapy and conduct basic research aimed at developing new treatments.
Intractable diarrhea, hypogammaglobulinemia, and brittle hair in a 5-month-old female infant causing from Tricho-hepato-enteric syndrome

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Background: A 5-month-old female infant, the only child of consanguineous parents, presented with chronic diarrhea for 2 months. She was born at GA 36 weeks with symmetrical SGA. Physical examination revealed severe cachexia and polydactyly in the left hand. Stool culture and food allergy evaluation were negative while stool fat globule was positive. Colonoscopy at age 2 years and 8 months showed multiple shallow ulcers. Diagnosis of Crohn's disease had been made. She was treated with amino acid formula and parenteral nutrition with partial improvement.

Case study: She had a history of recurrent infections including urinary tract infection with Klebsiella pneumoniae, gramnegative septic shock and catheter-related candidemia. Her immune status at seven months old revealed normal lymphocyte phenotyping with progressively decreases of T and B lymphocytes over time. Normal PHA was reported. Serum IgG and IgA were low; IgG=2.40 g/L (4.42-8.80), IgA=0.097 g/L (0.19-0.55) with normal IgM level; 0.567 g/L (0.31-0.77). She also had low specific antibody responses to protein antigens including hepatitis B, varicella and tetanus. As she grew, we noticed brittle hair and dysmorphic facies including broad nasal root and hypertelorism. Whole exome sequencing revealed biallelic variants in SKIV2L (c.1066C>T;p.Gln356Ter).

Conclusion: She was diagnosed with Trichohepatoenteric syndrome, a rare syndrome that links to alteration of SKI complex and defect in mRNA degradation. Currently, she was treated with regular intravenous immunoglobulin replacement, enteral nutrition via nasogastric tube, oral budesonide and sulfasalazine.
Prevalence of pathogenic variants in genes related to severe combined immune deficiency (SCID) from Genomic Thailand, the Thailand initiative on whole genome sequencing in health and disease Thai population

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Background: Prevalence of SCID in Thailand was unknown. We explored the prevalence of disease-causing variants in known genes related to SCID in Genomics Thailand, an initiative for population-based genetic study.

Methods: Genomic DNA was extracted from peripheral blood samples and sequenced using the BGI DNBSEQ-T7. Bioinformatics analyses were performed following GATK4.0 best practice. TAPES was employed to systematically categorize the pathogenicity of variants.

Result: The analysis included 15,629 subjects. None were identified to have homozygous allele. Seventeen known pathogenic variants were identified in 34 subjects: 1 IL7R variant in 9 subjects, 2 CD3D variants in 2 subjects, 2 JAK3 variant in 2 subjects, 4 LIG4 variants in 8 subjects, 5 RAG1 variants in 8 subjects, 1 NHEJ1 variants in 1 subject, and 2 ADA variants in 4 subjects. Four novel likely pathogenic variants in 6 subjects were identified in DCLRE1C (n=1), RAG2 (n=1), LIG4 (n=1), and JAK3 (n=3). In addition, 6 variants found in ClinVar database with uncertain clinical significance were identified in 9 subjects: DCLRE1C (n=1), CD3D (n=1), RAG1 (n=3), and LIG4 (n=4). Overall, the prevalence of carriers of known pathogenic alleles associated with SCID in this cohort is 2.17:1,000. The most prevalent gene is IL7R (5.8:10,000), followed by LIG4 and RAG1 (5.1:10,000).

Conclusion: SCID is a rare, life-threatening disease and requires high medical resources. The estimated number of SCID-causing allele carriers in Thailand could be as high as 0.2 percent of the Thai population. Infant screening of alleles identified from Genomic Thailand may be helpful in early diagnosis and intervention.
WAC23-0338
Chronic mucocutaneous candidiasis

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Background: Chronic mucocutaneous candidiasis (CMC) is a rare primary immunodeficiency disease which usually presents with recurrent or persistent skin and mucocutaneous Candida infections.

Case study: In this study, we present a case of CMC who presented with oral thrush 20 days after birth. At 1 year of age, her TSH hormone level was high and her T4 level was low. This patient had a family history of CMC; her younger sister and her father had an inherited mutation in STAT1 detected in WES. Familial CMC caused by inherited gene mutations was suspected. Immunological investigations were conducted, and the results were normal. The whole exome sequencing (WES) revealed mutations in the STAT1 gene (gain-of-function mutations). Her oral thrush disappeared after a period of itraconazole therapy, nevertheless, she subsequently needed itraconazole prophylaxis to control the disease.

Conclusion: A pedigree is essential in chronic mucocutaneous candidiasis cases and the genetic testing is necessary for early detection of this disease. Moreover, genetic counseling should be advised for family planning.
A food additive containing aluminum causes cleavage of interleukin-33 and gasdermin D in intestinal epithelial cells under antibiotic treatment

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Background: Aluminum (Al)-containing food additive, such as aluminum ammonium sulfate (AAS), causes severe cell death of intestinal epithelial cells (IECs) and eosinophilic infiltration in the gut of antibiotic-treated mice. In this study, we attempted to identify differentially expressed genes involved in cell death and allergy in mouse IECs after oral AAS administration with or without antibiotic treatment by RNA-seq and analyze activation of the key intracellular proteins.

Methods: C57BL/6 mice were given drinking water with or without ampicillin, neomycin, vancomycin, and metronidazole for 2 weeks. We isolated IEC fractions from mice after oral AAS administration, sorted EpCAM+CD45- IECs by a cell sorter, and performed RNA-seq. Western blot analysis used EpCAM+ cell lysates.

Result: AAS upregulated Il33 and Casp11 gene expressions in IECs. Antibiotic treatment upregulated Casp6 and Nlrp6 gene expressions, which was further enhanced by AAS. We observed an increased cleaved interleukin (IL)-33, cleaved IL-18, and active caspase-1 in IECs after oral AAS administration regardless of antibiotic treatment. However, active caspase-11, cleaved gasdermin D (GSDMD), and active caspase-6 were detected only in antibiotic-treated IECs after oral AAS administration.

Conclusion: These results indicate that oral AAS administration may trigger cleavage of IL-33, IL-18, and caspase-1 in IECs regardless of antibiotic treatment. Oral AAS administration may induce both pyroptosis and apoptosis by caspase-1, caspase-11, GSDMD, and caspase-6 activation in IECs under antibiotic treatment. Thus, an Al-containing food additive may cause severe IEC death, mature IL-33 and IL-18 secretion, and intestinal allergy under antibiotic treatment.
WAC23-0066
Functional analysis of omega-5 gliadin-dependent exercise-induced anaphylaxis in mice model

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¹doctor, Department of Respiratory Medicine and Clinical Immunology

Background: omega-5 gliadin, one of the wheat allergen components, is known to cause food-dependent exercise-induced anaphylaxis. In this study, we created an omega-5 gliadin-dependent exercise-induced anaphylaxis in mice model and analyzed its function.

Methods: B10.A mice were subcutaneously sensitized (6 times: Days 0, 7, 14, 21, 28, 35) with omega-5 gliadin (100 μg/mouse) and aluminum hydroxide gel adjuvant (2 mg/mouse). Blood was collected on Day 49 and serum omega-5 gliadin-specific IgE antibodies were analyzed by enzyme-linked immuno-sorbent assay. On Day 49, rectal temperature was measured before and after 30 min of exercise following transesophageal administration with omega-5 gliadin (15mg/mouse). A control group was omega-5 gliadin-sensitized mice without exercise. In addition, to analyze the Th1/Th2 balance on Day 49, the collected splenocytes were stimulated with omega-5 gliadin (1, 10, 100 μg/ml), and the expression of IFN-γ, IL-2, IL-4, IL-5, IL-13 mRNA was measured by real-time PCR.

Result: In the omega-5 gliadin-dependent exercise-induced anaphylaxis mouse model, a significant increase in serum omega-5 gliadin-specific IgE antibody was observed compared with the naive mice. There was a significant decrease in body temperature in the model mice compared with the controls. In addition, omega-5 gliadin-specific IL-4 and IL-13 mRNA were upregulated in the splenocytes of model mice compared with naive mice.

Conclusion: Using the omega-5 gliadin-dependent exercise-induced anaphylaxis in mice model, we would like to continue performing immunological analysis of the response mechanism underlying allergen immunotherapy and conduct basic research aimed at developing new treatments.
**WAC23-0227**

**Anti-allergic and anti-inflammatory effects of lidocaine-derived organic compounds on allergic rhinitis mouse model**

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**Background:** Lidocaine is recognized for its anti-inflammatory and anti-asthmatic properties. Lidocaine analogs, EI137 and EI341, have shown potential in inhibiting IL-5 induced eosinophil activation and survival. We assessed the anti-allergic and anti-inflammatory effects of these analogs using house dust mite (HDM)-induced allergic rhinitis mouse model.

**Methods:** We sensitized BALB/C mice with OVA and HDM allergens. From day 22 to 35, we intranasally administered 5 and 0.5 μg/g of EI137 and EI341, 1h before HDM stimulation. We measured nasal symptoms and quantified levels of interleukin (IL)-4, IL-10, interferon (IFN)-γ, and tumor necrosis factor (TNF)-α in nasal lavage fluid (NLF). Furthermore, we evaluated histological changes in sinonasal mucosa using hematoxylin and eosin as well as periodic acid-Schiff staining. Th cytokines and their transcription factor mRNA expressions were assessed through real-time reverse-transcription polymerase chain reaction.

**Result:** The intranasal administration of lidocaine analogs resulted in a significant suppression of allergic symptoms, inflammation in the sinonasal mucosa, and the presence of mucus-producing cells. Additionally, EI137 and EI341 substantially reduced IL-4, IL-10, and TNF-α levels in NLF, while also inhibiting the activation of splenocytes. Sinonasal mucosal cytokines related to Th2 and Treg responses, along with their respective transcription factors, were notably suppressed by the intranasal instillation of lidocaine analogs.

**Conclusion:** The lidocaine-derived compounds EI137 and EI341 exhibited compelling anti-allergic and anti-inflammatory effects in the context of an HDM-induced allergic rhinitis model. This study suggests the potential utility of lidocaine analogs as promising therapeutic agents for managing allergic inflammatory diseases.
Decreased eosinophilic airway inflammation by probiotics derived from healthy subjects.

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Background: Airway inflammation with eosinophilic infiltration and reversible obstruction of airways are well-known characteristics of asthma. Many studies showed that probiotics intake regulated airway inflammation sufficiently in humans and mice, and diverse probiotics are still isolated. However, these probiotics have different characteristics, and their effects of anti-inflammations vary. In this study, the regulation effect of 5 probiotics candidates isolated newly from healthy humans was evaluated in an experimental asthma model.

Methods: 6-week-old C57BL/6 female mice were sensitized with mixture of ovalbumin (OVA)-Aluminium hydroxide (Alum) on days 0 and 7 by intraperitoneal injection before intranasal challenge with OVA on days 14,15,21 and 22. Probiotics were orally administered for 7 days from the start of challenge. after evaluated the allergic symptoms.

Result: In terms of the ability to alleviate inflammatory cytokine production, Candidate A administration group was the most effective. Candidate A and C the production of cytokines that involve with Th2 immune response. The expression level of candidate A was higher in IL4,13 than candidate C, and also candidate A was effective in other cytokines (IL-4,IL-5, Eotaxin) Candidate A and C suppressed the production of OVA-specific IgE . The histological analysis confirmed that only candidate A was effective in eosinophilic airway inflammation.

Conclusion: Administration of the candidate A effectively inhibits airway inflammation, regulate cytokines, chemokines in OVA induced murine model. Candidate A was the most effective probiotics in allergic asthma among the newly isolated candidate groups.
WAC23-0317
Efficacy of specially formulated combination probiotic strains with vitamin D3 and Zn in children with atopic dermatitis

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Background: Atopic dermatitis (AD) is a chronic inflammatory, pruritic and relapsing skin disease, frequently originated in infants and young children. The objective of our study was to evaluate the clinical efficacy of specially formulated mixture of 3 probiotics strains with Zn and D3 in children with AD.

Methods: This prospective case control study was conducted in the University Hospital “Dr Dragiša Mišović”, Belgrade, Serbia. The study enrolled 150 patients with AD aged between 3 and 17 years. 75 participants received the treatment: mixture of 3 probiotic strains, with Zinc in Vitamin D3, once per day for 3 months as an add-on to standard AD treatment and 75 of them were on standard treatment.

Result: We found clinical improvement in the experimental group, demonstrated by statistically significant decrease of SCORAD after the treatment.

Conclusion: This study has found that mixture of 3 probiotics, Zn and vitamin D3 as an add on treatment in children with severe and moderate form of atopic dermatitis could reduce the severity of atopic dermatitis.
POSTER PRESENTATION

PDS4: Dec 2, 2023
(15.30-16.00)
Management of Allergic Rhinitis in the United Arab Emirates: Expert Consensus Recommendations on Allergen Immunotherapy

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Background: Allergic Rhinitis (AR) affects 10% to 30% of the global population, but little is known about its incidence and management in the United Arab Emirates (UAE) and the Middle East. The UAE has seen a rapid environmental change, primarily due to a significant rise in imported plantations, industrial pollution and an intensifying population growth, leading to increased incidence, prevalence and health burden of AR. Management strategies vary widely among practitioners, especially in light of lack of established guidance-based recommendations for effective management of Allergic Rhinitis, especially the use of Allergen Immunotherapy (AIT).

Methods: A group of five Board-Certified Allergists/Immunologists practicing in the UAE and an international expert discussed the management of AR in the UAE with a special focus on AIT, for the purpose of producing expert guidance. The arrival at consensus recommendations required two phases; anonymous online voting on a predetermined questionnaire comprised of 33 questions followed later by an in-person meeting where the panelists discussed survey results, shared their insights, and participated in detailed discussions before endorsing the final recommendations.

Result: The expert panel made several recommendations, stressing the fact that AIT is the only disease modifying treatment for AR. In addition to the severity and burden of the disease, patient choice should be considered for initiating AIT. Patient education was highlighted as important for patient adherence and rational expectations.

Conclusion: This first-ever Expert Consensus Recommendations on managing AR in the UAE focusing on AIT should help guide healthcare practitioners treating AR and encourage more national healthcare attention to this disease.
WAC23-0107
Allergic rhinitis in remission after house dust mite subcutaneous immunotherapy

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Background: Subcutaneous immunotherapy (SCIT) is a treatment option for moderate to severe allergic rhinitis (AR) patients. House dust mite (HDM) is the most common causative allergen for AR patients. Objective: To study long-term efficacy and identify factors that predict clinical remission after completing the HDM SCIT.

Methods: We conducted interviews with patients who had discontinued HDM SCIT after receiving treatment for three years or more. The interviews focused on their current AR symptoms, medication use for AR, and any newly diagnosed cases of asthma. Clinical remission was defined as the absence of daily anti-histamine or intranasal steroid usage. We compared patients in clinical remission with those who were still on medication.

Result: A total of 240 patients were enrolled with a median age of 21 years (range: 11-36 years), 46.7% started SCIT before the age of 18. 34.2% of patients had pre-existing asthma, and 47.5% had other atopic comorbid diseases. 174 (72.5%) patients achieved clinical remission. There were no significant differences in sex, HDM skin test size, duration of SCIT, aeroallergen sensitization pattern, or hospital protocols between patients in remission and those still on medication. Remission rate was significantly higher when SCIT started before 18 (86.7% vs. 59.8%, p < 0.001, aOR 4.36, 95%CI 1.70 – 11.16). Remission group had lower asthma comorbidity than on-medication group (aOR 3.05, 95% CI 1.04 – 8.91, p = 0.042).

Conclusion: HDM SCIT has long-term efficacy with a high clinical remission rate especially starting HDM SCIT before the age of 18 years.
**WAC23-0137**

**Skin prick tests. Seventeen years’ experience of the Allergu service from a third level medical center.**

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**Background:** Introduction. Skin prick testing is an essential test procedure to confirm sensitization in IgE-mediated allergic disease in subjects with allergic disease and can help to confirm the diagnosis of a suspected type I allergy. Objective. The purpose of this study is to report the status of skin prick tests made in the Allergy service from a Third level medical center.

**Methods:** Methods. This is a descriptive, retrospective, transversal study from July 2005 to December 2022. Selected medical records of patients with the most frequent allergic disease cases such as allergic rhinitis, asthma, atopic dermatitis and urticaria in whom skin prick tests were made. Patients were classified by age and sex and find out how many of them skin prick test were made and also how many patients began treatment with immunotherapy.

**Result:** Results. 5845 patients registered. 1521 skin prick tests were made. 4102 patients have diagnosis of the most frequent allergic diseases In 1227 patients skin prick tests were made as follows: allergic rhinitis 815 (66.4%), Asthma 250 (20.3%), Atopic dermatitis 108 (8.8%), Urticaria 54 (4.4%). 658 (53.6%) patients were in the range 5-14 years. 963 (78.4%) patients begun immunotherapy after skin prick test were made,

**Conclusion:** Conclusion. Skin prick tests are a useful tool that helps to confirm the diagnosis of a suspected type I allergy disease. Therefore to initiate immunotherapy as a treatment, what can prevent the progression of allergic disease with less need allergy medication.
WAC23-0209
Safety of mannoprotein-coated allergen nanoparticles and their efficacy of allergen immunotherapy in a mouse model of asthma

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Background: Allergen immunotherapy (AIT) is the only curative treatment for allergic diseases. However, AIT still faces many difficulties related to efficiency, safety, duration, and patient compliance. To enhance the safety and efficacy of AIT, we developed mannoprotein (MAN)-coated allergen nanoparticles. In this study, we evaluated the safety of these nanoparticles and the efficacy of AIT using them in a mouse model of asthma.

Methods: For safety evaluation, anaphylaxis model mice were intraperitoneally injected with Ovalbumin (OVA) or MAN-coated OVA nanoparticles (MDO), and rectal temperature was measured. For efficacy evaluation, the preventive and therapeutic effects of AIT using MDO on airway inflammation were evaluated in a mouse model of asthma. For preventive effect, OVA or MDO was orally administered before OVA sensitization, and for therapeutic effect, OVA or MDO was orally administered after OVA sensitization, followed by intranasal administration of OVA and evaluation of airway inflammation.

Result: In the anaphylaxis model, rectal temperature decrease was observed after intraperitoneal injection of OVA but not after injection of MDO. In both preventive and therapeutic AIT using MDO in the asthma model, a decrease in eosinophils in BALF and a decrease in infiltrating cells in lung tissue and PAS-positive cells in airway epithelium were observed compared to OVA administration.

Conclusion: MDO did not induce anaphylaxis and its safety was demonstrated. In addition, AIT using MDO showed significant preventive and therapeutic effects in a mouse model of asthma.
Musculin, a transcription factor that suppresses Th2 cell function, is a candidate biomarker for state of allergic rhinitis.

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Background: Allergic rhinitis is a growing problem worldwide but there are no relevant biomarkers. In addition, sublingual immunotherapy is becoming widely used, but no biomarker for its efficacy has been established.

Methods: To investigate biomarkers, we cultured PBMCs obtained both before and at 1 year after initiating SLIT and used a combination of single-cell RNA sequence and repertoire sequencing. To confirm, we used PBMCs from patients participating a clinical trial of SLIT tablets and volunteers, including asymptomatic sensitization.

Result: Following sublingual immunotherapy (SLIT), antigen-triggered culturing led to the expansion of clonal Th2 and Treg cells within the CD4+ T cell subset. The majority of these CD4+ T cells maintained their CDR3 regions prior to and after the treatment, indicating specific clonal responses to the antigen and subsequent differentiation due to SLIT. Nonetheless, SLIT resulted in a decrease in the count of functional clonal Th2 cells, while concurrently fostering an upsurge in the population of Trans-type Th2 cells expressing musculin (MSC) and TGF-β. These elements contribute to the promotion of differentiation into Treg cells. Trajectory analysis suggested that SLIT prompted the clonal differentiation of Trans-type Th2 cells, culminating in their transformation into Treg cells. We validated the increase of MSC following SLIT and observed fluctuations in MSC in accordance with the disease status.

Conclusion: SLIT promotes the expression of MSC on pathogenic Th2 cells and suppresses their function. The expression of MSCs varies depending on the disease state, and MSC may be a potential biomarker for allergic rhinitis.
The effect of Japanese cedar pollen sublingual immunotherapy tablets on allergic rhinitis during Japanese cypress pollen dispersal season.

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Background: Japanese cedar (JCe) and Japanese cypress (JCy) pollinosis are the most common forms of allergic rhinitis (AR) in Japan. JCe and JCy are phylogenetically closely related tree species, and pronounced IgE cross-reactivity towards JCe and JCy major allergens due to a high level of amino acid sequence similarity has been described. Clinically, many patients with JCe pollinosis suffer from AR symptoms during both the JCy and JCy pollen dispersal periods. Therefore, this study aimed to evaluate the efficacy of the JCe pollen sublingual immunotherapy (SLIT) tablet in patients with AR during the JCe and JCy pollen dispersal periods.

Methods: This study was a post hoc analysis of the 206-2-1 JCe SLIT-tablet trial (JapicCTI 142579). 1042 JCe pollinosis patients were randomized to receive either placebo or JCe SLIT tablets. Total rhinitis symptom and rescue medication scores were assessed during the JCe and JCy pollen dispersal periods. JCe and JCy pollen-specific IgE responses were measured by ImmunoCAP.

Result: The mean total symptom and rescue medication scores were significantly lower in the SLIT group compared to the placebo group during both the JCe and the JCy pollen dispersal periods. Increases in JCe and JCy pollen-specific IgE were detected after 3 months of JCe SLIT tablet treatment.

Conclusion: These findings suggest that the JCe SLIT-tablet is clinically relevant for the treatment of both JCe and JCy pollinosis, possibly due to the close phylogenetetic relationship of the two species and strong immunological cross-reactivity towards JCe and JCy major allergens.
**WAC23-0329**  
**Adherence and safety of an accelerated initial build-up schedule of subcutaneous allergen immunotherapy for three weeks in patients with allergic diseases sensitized to house dust mite**

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**Background:** Subcutaneous allergen immunotherapy (SCIT) requires weekly injections for 8-12 weeks to reach a monthly maintenance injection dose in a standard initial build-up schedule. The accelerated schedules of SCIT can save time and effort of patients with allergic diseases. This study aimed a retrospective analysis of adherence and safety of accelerated initial build-up schedule consisted of 4 weekly SCIT for 3 weeks performed in an outpatient clinic.

**Methods:** The initial build-up schedule for 3 weeks consisted of 4 weekly injections (0.1, 0.2, 0.4, and 0.8 mL), and then monthly injections (1.0 mL) of maintenance concentration vial of tyrosine-absorbed house dust mite (HDM) extract. We applied this accelerated SCIT schedule in patients with allergic diseases (allergic rhinitis and/or atopic dermatitis) sensitized to HDM. Systemic reaction (SR) were classified according to the WAO grading system.

**Result:** Among the 130 patients who received at least one dose of SCIT with an accelerated SCIT schedule, 125 patients (96.2%) completed the initial build-up schedule for 3 weeks, and 123 patients (94.6%) completed both the initial build-up schedule and the first dose of maintenance schedule at week 7. The SR was observed in 3 of 130 patients (2.3%) with allergic diseases during the accelerated initial build-up schedule. All the patients experienced mild SR (grade 1) and were recovered without treatment.

**Conclusion:** A shortened initial build-up schedule of SCIT with unmodified HDM extracts for 3 weeks, conducted in an outpatient clinic, was safe and useful in patients with allergic diseases sensitized to HDM.
**WAC23-0007**

**Environmental anamnesis and its impact on allergic rhinitis prevention**

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**Background:** Biodiversity and global environmental exposures represent a serious threat to children's health, especially allergic and respiratory diseases, including Rhinitis, deserving investigation and action. The objective was to assess the environmental health of a sample of children living in rural areas of the Municipality of Uruguaiana (Brazil) and its impact on Rhinitis.

**Methods:** Parents (n= 231) of elementary school children in rural areas of the municipality of Uruguaiana (September to December 2022) answered the Environmental Anamnesis in Pediatrics (SBP): 75.4% of them were under 12 years old and 84% lived in rural areas (183/231).

**Result:** Evaluating the outcome of having allergic rhinitis or not, we found that having a mother with no education or incomplete elementary school (31.4% x 68.6%, p=0.010), living on a paved street (53.3% x 46.7%, p=0.04), did living close to the chemical industry (35.2% x 64.8%, p=0.041), had sewage system (44.6% x 55.1%, p=0.019), having mold/humidity in their home (23.6% x 67.4%, p=0.012), cooking with LPG (41.1% X 58.9%, p=0.012), cooking with electric energy (32.2% X 67.8%, p=<0.001) were more frequent associated with to have rhinitis.

**Conclusion:** The Environmental Anamnesis made it possible to identify the unfavorable exposures to which children and adolescents in rural areas were subjected and which may represent serious threats to the development of allergic Rhinitis. Keywords: environmental health, children, adolescents, allergies, respiratory diseases.
WAC23-0022
The efficacy of adjuvant sublingual immunotherapy after septomeatoplasty: A NonRandomized Controlled Study

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Background: The efficacy of adjuvant sublingual immunotherapy (SLIT) on patients who have undergone septomeatoplasty (SMP) to correct structural problems in mite allergic rhinitis has not ever been studied.

Methods: This study was a non-randomized controlled study that recruited mite allergic rhinitis (AR) patients concurrent septum deviation and inferior turbinate hypertrophy in a tertiary hospital in Taiwan. SMP was performed on all patients as a surgical intervention. Then patients were divided into two groups: the control group, which received surgery only, and the experimental group, which received SLIT as an adjuvant treatment. The demographic data and Rhinitis Control Assessment Test (RCAT) questionnaire were analyzed.

Result: 96 patients were enrolled to the study (SMP+SLIT group: 52; SMP only group: 44). There were no significant differences in all variables between the two groups before and one month after the surgery. However, at the third and sixth month evaluation, the SMP+SLIT group showed better maintenance of total RCAT scores compared to the SMP only group (28.6 ± 1.56 vs. 24.5 ± 3.66, p < 0.001; 27.1 ± 2.87 vs. 19.9 ± 5.56, p < 0.001). In addition, significantly better control of all RCAT sub-items was proved in the SMP+SLIT group at the third and sixth-month evaluation.

Conclusion: SLIT may serve as an ideal adjuvant therapy following SMP in mite AR patients, particularly in regards to sneezing.
WAC23-0039
High-intensity focused ultrasound (HIFU) as a new device for treatment of inferior turbinate hypertrophy due to allergic rhinitis: Comparison study with coblation

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Background: Various procedures are performed for patients with inferior turbinate hypertrophy (ITH). We developed a new surgical device for the treatment of ITH that uses high-intensity focused ultrasound (HIFU) and performed a clinical trial of patients with ITH.

Methods: A total of 20 patients with allergic rhinitis underwent inferior turbinate surgery, which consisted of either HIFU or coblation therapy. Efficacy was evaluated by subjective symptom scores, acoustic rhinometry, and nasal endoscopy.

Result: The modified nasal obstruction symptom evaluation (NOSE) score and nasal obstruction visual analog scale (NO-VAS) were significantly decreased in both groups at 12 weeks postoperatively. Differences in the evaluation scores between two groups were not significant. On nasal endoscopy, the HIFU patients showed the improvement in mucosal swelling sooner than the patients underwent coblation therapy did. Nasal crusting was significantly increased in the coblation group than the HIFU group until postoperative 4 weeks. Mucosal preservation was superior in the HIFU patients to coblation patients. Although HIFU was less painful than coblation during the procedure, the difference was not significant (4.9 vs 6.3, p=0.143). The difference in the global satisfaction between two groups was not significant, although it was slightly greater for the HIFU than the coblation (4.6 vs 4.1, p=0.393).

Conclusion: HIFU provided similar results to those of coblation therapy in relieving nasal obstruction due to ITH, but HIFU therapy caused less discomfort during the procedure than coblation therapy. HIFU therapy could be an effective and noninvasive alternative to the current surgical modalities for ITH.
**WAC23-0067**  
The effect of omalizumab on cedar pollinosis: measured by nasal lavage

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**Background:** Seasonal allergic rhinitis due to Japanese cedar pollen (SAR-JCP) was a very frequent disease in Japan. Omalizumab has been reported to significantly reduce nasal symptoms and quality of life in patients with allergic rhinitis, but other than a decrease in free IgE, biomarker activity is not clear. In the study, we examined proteins in nasal discharge of patients treated with omalizumab before and one month after treatment in order to elucidate the pathophysiology of omalizumab's effect on allergic rhinitis.

**Methods:** Omalizumab was administered to 12 patients with uncontrolled SAR-JCP. The effects of omalizumab were measured by nasal symptoms, ocular symptoms, Japanese Rhinoconjunctivitis Quality of Life Questionnaire (JRQLQ), serum IgE, peripheral blood eosinophil, and The collected nasal lavage fluid was assayed for Eosinophil CationicProtei (ECP), IgE, Histamine, and Cysteinyl Leukotriene using ELISA at week 4.

**Result:** The nasal symptom, ocular symptom, and JRQLQ improved significantly by treatment. The number of eosinophils in the peripheral blood was no change. Total IgE in peripheral blood increased significantly. ECP in nasal lavage solution decreased significantly from 33.14±32.92 to 12.87±12.28 [ng/mL] (P=0.043) and Cysteinyl Leukotriene from 1472.04±513.99 to 1221.45±240.82 [pg/mL] (P=0.007). IgE from 0.87±1.21 to 1.15±1.28 [ng/mL] (P=0.055) and Histamin from 13.07±21.50 to 7.36±7.66 [ng/mL] (P=0.622) were unchanged.

**Conclusion:** Omalizumab treatment significantly reduced ECP and Cysteinyl Leukotriene in nasal lavage solution after 1 month. The therapeutic effect of omalizumab on hay fever symptoms was suggested to be due to eosinophilic inflammation and a decrease in Cysteinyl Leukotriene.
Successful treatment of omalizumab on uncontrollable nasal mucosal contact point headache caused by cedar pollinosis

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Background: The prevalence of cedar pollinosis is estimated at approximately 38.8% and is increasing in Japan. The management of cedar pollinosis in pediatric patients is important, because it can cause sleep disturbances and poor academic performance in addition to nasal and eye symptoms. Omalizumab is approved in Japan as an add-on treatment option for severe cedar pollinosis, but few studies have investigated its real-world clinical efficacy in pediatric patients with seasonal allergic rhinitis.

Case study: We report the case of a 15-year-old male with allergic rhinitis to multiple antigens such as several pollens and house dust mite since childhood suffered from uncontrolled facial pain and headache during the annual cedar pollen season despite using anti-histamine drug and intranasal corticosteroid spray. Sinus CT scan and nasal endoscopic finding showed contact between the swollen inferior turbinate and the nasal septum. As a diagnosis of nasal mucosal contact point headache caused by cedar pollinosis, we initiated the add-on therapy of omalizumab. 3 days after administration of omalizumab, his symptoms of naso-ocular problems, QOL deficits and headache improved markedly accompanied with the improvement of nasal endoscopic finding.

Conclusion: Nasal mucosal contact point headache is a disease that is clearly stated in the International Classification of Headaches but is not well known. It is a headache that can be cured with proper treatment and needs to be known as a differential diagnosis of headache. Add-on treatment with omalizumab was effective in the treatment of nasal mucosal contact point headache caused by severe cedar pollinosis.
WAC23-0091
Refractory rhinorrhea in drug-induced rhinitis: an evidence-based case report

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Background: Drug-induced rhinitis is a phenotype of non-allergic rhinitis which may occur after taking several medications, such as antihypertensives, NSAID, aspirin, intranasal decongestant, and other drugs. Discontinuation of the offending medications would be the ideal treatment. When not possible, initiation of intranasal corticosteroid and intranasal antihistamine is recommended to reduce the symptoms. Turbinate surgery is an alternative when medical treatment fails. This evidence-based case report aims to elaborate the effectiveness of radiofrequency ablation of nasal turbinate in managing refractory rhinorrhea in chronic rhinitis.

Case study: A 51-year-old woman with myasthenia gravis presents with nasal congestion and refractory runny nose. Her ocular symptoms improved on pyridostigmine, but she experienced bothersome runny nose minutes after taking the drug. Despite twelve weeks of treatment with antihistamine, intranasal glucocorticoid, and saline nasal douching, her nasal symptoms remained unaffected. She demonstrated clinical improvement in total nasal symptom score (TNSS), including rhinorrhea, at 3 months after receiving radiofrequency ablation of posterior nasal nerve. A systematic search from five databases was conducted using combination of keywords as "chronic rhinitis" AND "rhinorrhea" AND "radiofrequency" AND "posterior nasal nerve". Five articles were eligible for critical appraisal.

Conclusion: Evidence showed that radiofrequency ablation of posterior nasal nerve of the turbinate is effective in reducing reflective total nasal symptom score (rTNSS) at 3 months and through 24 months follow-up. In conclusion, patients with refractory rhinorrhea most likely benefit from radiofrequency ablation of posterior nasal nerve procedure as demonstrated in our case.
Sublingual Immunotherapy for Allergic Rhinitis The Clinical Symptomatic Remission

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**Background:** Allergen specific immunotherapy has been used as an effective treatment for allergic diseases. Sublingual immunotherapy (SLIT) is in the spotlight because it is non-invasive, can be administered at home, and is less likely to accompany serious complications. Apart from these advantages, we tried to evaluate the incidence of symptomatic remission after SLIT, a patient who did not need allergic rhinitis (AR) medication after treatment in AR patients.

**Methods:** The patients who received SLIT were enrolled between November 2007 and February 2015. Each patient was scheduled to undergo treatment and was followed up regularly using a diary card, on which a symptom score, rescue medication score was recorded. In addition, the patients were interviewed via telephone in January 2023 to ask current AR symptoms, current medication use status.

**Result:** A total of 103 patients completed the SLIT without dropout and the cases consist of 77 men, 26 women patients. Allergic rhinitis symptoms improved after SLIT, and the AR medication use decreased significantly. 34 out of 103 patients were able to stop using the medication anymore with clinical remission of AR at the end of the SLIT. 70 out of 103 patients responded the telephone survey and among them, 23 patients (32.9%) answered that they don’t need to use AR medication after SLIT treatment anymore.

**Conclusion:** Through SLIT, allergic symptoms are expected to significantly decrease, and even after treatment, it is expected to significantly affect the reduction of the frequency and severity of symptoms without AR medication in a large number of patients.
Immunotherapy in Chronic Rhinosinusitis with Allergic Rhinitis. Does it Improve the Quality of Life?

Background: Chronic rhinosinusitis without nasal polyposis (CRSsNP) and allergic rhinitis (AR) are a commonly diagnosed upper airway disease in the worldwide population. Allergen immunotherapy has proven to be efficacious in treating AR. The aim of this study was to investigate the effect of allergen immunotherapy in the quality of life (QoL) in CRSsNP patients with underlying AR.

Methods: This was a prospective study involving CRSsNP patients with positive skin prick test (SPT) towards house dust mite (HDM). A baseline QoL assessment via Sinonasal Outcome Test 22 (SNOT-22) and objective tool using peak nasal inspiratory flow (PNIF) were recorded and patients were followed up in 1, 3 and 6 months for subsequent reassessment.

Result: 78 patients were enrolled in the study which demonstrated significant improvement in the QoL through SNOT-22 (p < 0.05). Objective PNIF revealed improvement in the sinonasal passage with mean score (176.1, ± 46.15, p=0.001)

Conclusion: Sublingual immunotherapy is an effective therapy in treating CRSsNP and subsequently improved the QoL.
A novel Japanese cypress pollen, Cha o 3, may not be a major Japanese cypress pollinosis allergen

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Background: In Japan, the most prevalent causes of seasonal allergic rhinitis are pollen from Japanese cedar (JCe) and Japanese cypress (JCy). Recently, Cha o 3 was identified as a new JCy pollen allergen in addition to the major allergens Cha o 1 and 2, but the allergenicity remains unclear. This study aimed to investigate the allergenicity of JCy allergens (Cha o 1, 2, and 3).

Methods: Allergic patients sensitized to JCy and JCe were selected (n=27, specific IgE (s-IgE)>0.7 kU/L for both species). Basophil activation test was conducted (Allergenicity kit). The s-IgE by inhibition test was measured with purified, native Cha o 1, 2, and 3.

Result: Basophils were significantly activated by Cha o 1 and 2 (10 ng/mL) compared to PBS (Cha o 1: 96%, n=26, Cha o 2: 67%, n=18, respectively). In contrast, no increase response was observed with Cha o 3 (100 ng/mL as the highest concentration). In the inhibition test, the mean values of JCy s-IgE by pre-incubation with Cha o 1, 2, and 3 were 5.7 kU/L, 7.6 kU/L, and 12.3 kU/L, respectively. (suppression rates: 54%, 46%, and 10%).

Conclusion: These results demonstrated that Cha o 1 and Cha o 2 showed the allergenicity. However, Cha o 3 showed a lack of increased basophil activation and very modest inhibition of IgE binding, suggesting that Cha o 3 may not be a crucial role of major allergen compared to Cha o 1 and 2.
Epidemiology of allergic rhinitis cases in the Allergy service of a third level medical center.

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Background: Introduction. Allergic rhinitis is the most frequent allergic disease among paediatric population, the allergy service was created in July 2005 to attend properly this group of patients in the general consultation of a third level medical centre. Objective. The purpose of this study is to report the cases of allergic rhinitis diagnosed from July 2005 to December 2022.

Methods: Methods. This is a descriptive, retrospective, transversal study between the period mentioned above. Selected medical records of patients apply for diagnostic criteria according to an updated ARIA guide used to make diagnosis of allergic rhinitis. Patients were classified by age and sex.

Result: 5845 medical records of patients were registered between period mentioned above. 2293 patients completed criteria for diagnosis of allergic rhinitis. Distribution of patients by age and sex showed that 1119 (48.8%) patients were male, 1174 (51.2%) patients were female. 1235 (53.8%) patients were found to be in the range of 5–14 years. The majority of asthma patients were females in the range of 5–9 years with 418 (18.2%) patients.

Conclusion: Allergic rhinitis has the highest incidence among allergic diseases in children, is the main cause of consultations in the Allergy service. Therefore diagnosis of allergic rhinitis is mandatory because of the confusion of symptoms mainly related with upper respiratory tract infections. Education of parents and patients is also an important task in the management of allergic rhinitis.
Association between Clinical Remission of Infantile-Onset Allergic Rhinitis/Conjunctivitis during the School-age Period and the Type of Housing: A Longitudinal Population-Based Japanese Study

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Background: Environmental factors significantly contribute to the development and remission of allergic rhinitis. However, the role of long-term exposure to residential environments in the remission of allergic rhinitis remains unclear. This study investigated the association between clinical remission of infantile-onset allergic rhinitis/conjunctivitis (ARC) and the type of housing.

Methods: This study used data from the Longitudinal Survey of Newborns in the 21st Century (2001 Cohort), focusing on 53,575 children born in 2001 in Japan. We examined whether infantile-onset ARC remitted between the ages of 10 and 12 years. We classified the type of housing at the age of 2.5 years into four groups: detached house and multi-unit residential building with 1–2, 3–5, and ≥6 floors. Poisson regression with robust variance was performed to examine the association between the type of housing and clinical remission of ARC, with a detached house as the reference.

Result: Overall, 4,352 children had infantile-onset ARC between the ages of 1.5 and 4.5 years. The remission rate of infantile-onset ARC by the ages of 10 and 12 years was 42.9%. Multivariate analysis showed that living in multi-unit residential buildings with 1–2 and ≥6 floors was associated with clinical remission of ARC (adjusted risk ratio (aRR) = 1.10; 95% CI, 1.01–1.20; aRR = 1.31; 95% CI, 1.14–1.51, respectively).

Conclusion: The type of housing may be associated with clinical remission of infantile-onset ARC during the school-age period.
WAC23-0130
CACNA1C as a predisposing factor by an integrative study for the risk of childhood allergic rhinitis in COCOA

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Background: Allergic rhinitis is affected by both genetic and environmental factors. We aimed to investigate that the association of 3-years old allergic rhinitis with genetic polymorphisms.

Methods: To identify the variants associated with allergic rhinitis and eosinophil we performed regression using Korean chip genotype data. In addition, to identify epigenetic biomarker, we performed in a cord blood-based DNA methylation analysis using Infinium HumanMethylation850 BeadChip (n=147).

Result: we have found genome-wide significant CACNA1C rs16929401. As a result, Children having TT genotypes had a higher risk of allergic rhinitis and eosinophil levels than those having C allele. Also, CACNA1C rs16929401 variant was significantly associated with maternal specific IgE to Dermatophagoides farina during pregnancy. TT genotype carriers of CACNA1C rs16929401 showed increased CpG signal in cg21108811 in CACNA1C gene when compared to CT or CC carriers.

Conclusion: An integrative multi-target analysis might reveal new functional implications related to epigenetic control according to genotype in allergic rhinitis. Furthermore, we are developing a prediction model for allergic rhinitis in a 6-yearold based on machine learning using related environmental factors and CACNA1c variants that affect allergic rhinitis.
WAC23-0131

Allergy (A) destroys the sleep architecture. A treatment (Treat) in allergic children (AL.C.) a) decreases intra-sleep arousal (Intr.Sl.Arous.) (>30 second) & sleep latency (SL), b) increases sleep efficacy (SL.E.), c) repairs the distorted from A sleep architecture.

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Background: AL.C. suffer severe sleep disorders (SSD) & Obstructive Sleep Apnoea (OSA). The origin & the pathophysiology of their SSD/OSA & the adequate Treat have not been studied. Objectives: To explore the origin of SSD/OSA in AL. C. & identify the adequate Treat to ameliorate SSD.

Methods: 52 AL.C. (aged 2–16 years old) who suffered respiratory and/or food allergies had overnight Polysomnography (PSG) at home (PSG1) before initiation of adequate A Treat (Specific Sublingual Immunotherapy, and/or Specific allergen eviction diet and/or amino acid-based formula). 13 AL.C. had PSG 2 months after A Treat initiation (PSG2). We compared parameters of PSG1 (before A Treat) to PSG2 (after A Treat) with a paired t-test.

Result: The AL.C. experienced: 1) decreased Intr. Sl. Arous. [>30 seconds (sec)] [p 2-sided (p)]= .062) after A Treat [mean (M)=18.83, Standard Deviation (SD)=10.098] than before A Treat (M=24.83, SD=9.814)(95% CI for the difference .359,12.359), t (11):2.077, Cohen’s d=10.009, 2) decreased N3 (%) (p= .025) after A Treat (M=35.5, SD=14.48) than before (M=46.0, SD=19.13), (95% CI 1.602, 19.41), t(12)= 2.571, Cohen’s d=14.73. 3) decreased N2 (%) (p=.089) after A Treat (M=40.046, SD=14.46) than before (M=31.10, SD=17.47) (95% CI -19.46,1.58), t (12)= -1.85, Cohen’s d=17.42. 4) increased Sl. E. (p=.076) after A Treat (M=85.70, SD=7.98) than before (M=76.60, SD=13.318) (95% CI -1.181,19.381), t (9) =2.002, Cohen’s d=14.372. 5) decreased SL (Minutes) (p one-sided = .084) after A Treat (M=30.22, SD=29.96) than before (M=64.56, SD=63.49), (95% CI -18.015,86.682), Cohen’s d=68.1.

Conclusion: Allergies provoke significant ENT inflammation, which alters the sleep architecture in AL.C. Allergy Treatment: 1) decreases Intra Sleep Arousal (>30 sec), N3 (%), Sleep Latency, 2) increases Sleep Efficacy, N2(%), 3) tends to normalize the initially disturbed from Allergy, sleep architecture.
WAC23-0143
Validation of a Mobile Naturalistic Exposure Chamber for Dust Mite

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Background: Small portable allergen exposure chambers could be useful for clinical research and allergy diagnostics. We have developed a mobile allergen chamber (EnviroMini™) to precisely dispense and aerosolize milled dust mite. We describe technical and preliminary clinical validation data for the chamber.

Methods: The EnviroMini™ consists of an indoor pop-up tent with a carpeted floor and subject seating. Milled spent dust mite culture (D. pteronyssinus) was dispensed in controlled amounts at programmed intervals into the exhaust of a modified robot vacuum cleaner to aerosolize the allergen. Der p 1 air concentration was measured from air samples collected onto glass fiber filters and quantified with ELISA. Two-hour tests evaluated the impact of varying dispense duration and frequency on Der p 1 levels and stability. Preliminary data on the allergic response (Total Nasal Symptom Score, TNSS) to dust mite aerosolization was obtained in one subject exposed to dust mite for 2 hours on two separate occasions.

Result: Average (SD) Der p 1 air concentration for the selected dispenser settings was 45 (16) ng/m³ (n=6). The allergen level was consistent for the length of exposure. During the subject’s first exposure, Der p 1 was 55 ng/m³ and peak TNSS was 6. On the second exposure, Der p 1 was (52) ng/m³ and peak TNSS was 5. Respiratory symptom scores were also comparable at 4.5 and 4.3.

Conclusion: House dust mite aerosolization in the EnviroMini™ was stable and reproducible. Comparable symptoms were induced in two exposures of an ongoing clinical validation.
**WAC23-0151**

**General practitioner and patient perspectives on assessing obstacles encountered while adhering to allergic rhinitis recommended treatment duration: a non-interventional, cross-sectional study**

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**Background:** Currently no guidelines exist recommending allergic rhinitis (AR) intranasal corticosteroid (INCS) duration. We describe real-world AR-INCS general practitioners (GPs)’ prescription patterns and patients’ use.

**Methods:** This multinational non-interventional, cross-sectional study used online GP and patient surveys in four countries. Eligible GPs: had 3–35 years’ practice experience, regularly prescribed AR-INCS, managed ≥5 AR patients/month per AR Impact on Asthma recommendations (Bousquet. JACI. 2020; 145:70-80.e3) in the prior year. Included patients were: any sex, 18–65 years, GP-treated for AR, AR-INCS medication users (≥12 months), coming from countries with 15–50% AR prevalence and prescription-only INCS use ≥100 million units/annum (Brazil, Mexico, Spain, Thailand). We obtained: AR-care, INCS-use perspectives via GP-surveys and GP-addressed Patient Record Forms (PRFs, 3/GP); and AR-INCS experience, treatment, adherence timeline challenges via patient-completed surveys. Target sample: 75 GPs+75 patients/country.

**Result:** From 300 GPs surveyed/panel-size=134,000 and 900 PRFs, mean INCS recommended durations (weeks) were: Brazil 8.4; Mexico 8.3; Spain 5.4; Thailand 6.4. Top-ranked PRF-reported factors influencing AR-INCS treatment duration were: symptom severity (76–85%), symptom recurrence (Brazil 73%; Mexico 64%; Spain 52%; Thailand 49%), existing comorbidities (Brazil 33%; Mexico 44%; Spain 43%; Thailand 57%). With favourable response, GPs reported continuing INCS at decreased (49–55%) or same dose (13–43%); in non-responders, checking adherence (9–51%) or specialist-referral (4–51%). Patients surveyed (n=300/panel-size=95,000) reported mean INCS recommended/use durations (weeks): Brazil 6.4/6.2; Mexico 5.1/4.8; Spain 4.0/3.6; Thailand 4.9/6.4.

**Conclusion:** Real-world GP- and patient-reported AR-INCS treatment duration and practice patterns vary among four high AR prevalence-countries. Understanding differences may facilitate enhanced appropriate AR-INCS use.
Factors contributing to the diagnosis and onset prediction of pediatric perennial allergic rhinitis: a sub-analysis of the CHIBA study

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Background: This study aimed to clarify the diagnostic and predictive factors for perennial allergic rhinitis (PAR) onset in children by analyzing the results of the Chiba High-risk Birth Cohort for Allergy study, which examined newborns with a family history of allergies.

Methods: Overall, 306 pregnant women were recruited. Their newborns were examined by otolaryngologists and pediatric allergists at 1, 2, and 5 years of age. Participants with clinical and laboratory data available at all consultation points were considered eligible.

Result: Among 187 eligible participants, the prevalence rates of PAR were 2.1%, 4.3%, and 24.1% at 1, 2, and 5 years of age, respectively. AR-specific nasal local findings and eosinophils in nasal smear were observed in a substantial number of patients with PAR at 1 and 2 years of age. Factors present up to 2 years of age that were associated with PAR onset at 5 years of age, in descending order, were as follows: sensitization to house dust mites (HDM), nasal eosinophils, and sensitization to cat dander. The sensitivity and specificity of a combination of HDM sensitization and nasal eosinophil appearance up to 2 years of age for PAR onset at 5 years of age were 76.0% and 73.7%, respectively.

Conclusion: Rhinitis findings and nasal eosinophils are useful auxiliary diagnostic items for pediatric PAR. Sensitization to HDM and nasal eosinophils were the most influential factors associated with future PAR onset. A combination of these factors may facilitate the prediction of PAR onset.
A case of multiple cerebral infarctions during the administration of dupilumab for chronic rhinosinusitis with nasal polyps.

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Background: Dupilumab is an anti-IL-4 Rα monoclonal antibody that inhibits IL-4 and 13, demonstrating a potent effect in reducing nasal polyps associated with CRSwNP. While severe adverse events related to dupilumab have been infrequently reported, some patients have experienced eosinophilia-related conditions such as eosinophilic granulomatosis with polyangiitis (EGPA) or eosinophilic pneumonia after initiating dupilumab treatment.

Case study: We present the case of a 71-year-old female with refractory CRSwNP and asthma who received dupilumab therapy. Following the fourth injection, she experienced a sudden onset of memory impairment and ataxia in her left leg. Magnetic resonance imaging of the brain revealed multiple acute infarctions in the cerebral hemisphere. Blood tests indicated severe peripheral blood eosinophilia (11005 cells/μL) and moderate inflammation (C-reactive protein 3.09 mg/dL). PR3- and MPO-ANCA tests were negative, and bone marrow examination showed normoplastic findings. The patient was diagnosed as EGPA with acute cerebral infarction. Dupilumab was discontinued, and prednisolone was initiated at a dosage of 1 mg/kg. Following the administration of prednisolone, her eosinophilia and symptoms of infarction rapidly improved. The dosage of prednisolone was gradually tapered and eventually discontinued after three months. To date, the patient has not experienced any stroke or recurrence of EGPA since discontinuing prednisolone.

Conclusion: CRSwNP and asthma are known risk factors for EGPA development, and it is recognized that dupilumab can exacerbate peripheral eosinophilia. Considering this patient's lack of any history of EGPA or eosinophilic pneumonia before initiating dupilumab treatment, vigilance is necessary regarding these eosinophilia-related conditions during the administration of this medication.
WAC23-0223
Preschool Allergic Rhinitis is Associated with Psychological Difficulties and Problematic Behaviors in Childhood.

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Background: The association between allergic rhinitis (AR) and problematic behaviors from previous studies was limited by cross-sectional design and small sample sizes. We aimed to investigate the relationship between preschool AR and problematic behaviors in childhood.

Methods: We analyzed 451 children from COCOA study. Preschool AR from 5 to 6 years old was diagnosed by pediatric allergists, and the 5 AR trajectories were determined using latent class analysis. Problematic behaviors during childhood from 10 to 12 years old were evaluated using Child Behavior Checklist (CBCL). Multivariable logistic regression analysis was conducted to investigate the association between preschool AR and children's behavior problems.

Result: Preschool AR increased the risk of anxiety (aOR 3.21, 95% CI 1.32-7.83), obsessive-compulsive problems (aOR 4.35, 95% CI 1.82-10.37) and sluggish cognitive tempo (aOR 3.83, 95% CI 1.21-12.19) with additional adjustment for current AR and history of leukotriene and antihistamines use when the children reached 10 to 12 years old. Specifically, children with late onset AR phenotype had higher CBCL scores (total problems, p=0.033; internalizing problem, p=0.023; somatization problems, p=0.033;
obsessive-compulsive problems, p=0.022) compared with control group. From children who had normal CBCL scores during the preschool period, preschool AR children showed higher CBCL scores in somatic complaints, somatic problems, obsessive-compulsive problems at 10 to 12 years.

**Conclusion:** AR in preschool children affects behavioral problems in school aged children, especially in late onset AR phenotypes. These findings suggest that AR in preschool children is linked to behavioral problems in school children.
Impact of Ambient Air Pollution on Health-Related Quality of Life in Thai University Students

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Background: Global awareness of ambient air pollution has been growing due to its significant risk on health. This study aimed to evaluate the impact of air pollution on health-related quality of life (HR-QoL) among university students living in Chiang Mai, Thailand.

Methods: Four hundred and six students were recruited from Chiang Mai University (CMU) and Maejo University (MJU), which are in urban and suburban areas in Chiang Mai, respectively. Assessment of participants' health status, respiratory allergies, nasal symptoms, and quality of life were performed by using the Global Asthma Network questionnaires (GAN) and the rhinoconjunctivitis quality of life questionnaires (RCQ36) compared between low- and high-air pollution periods.

Result: One hundred and thirty-one (32%) students self-reported and/or medical recorded of having allergic rhinitis (AR) symptoms, which affected their RCQ36 scores compared to students in the non-AR group. The baseline RCQ36 scores of students living in urban areas were worse compared to the sub-urban group on sleep disturbance, social functioning, role limitations, and other symptoms domains. The ambient air pollution greatly affected all RCQ36 domains of both students living in urban and sub-urban areas, and both AR and non-AR groups. However, only the non-AR group reported statistically significant worsening RCQ36 scores on respiratory, eye symptoms, and overall health domains during the high- compared to the low-air pollution period.

Conclusion: The study demonstrated the negative impact of ambient air pollution on the HR-QoL of university students living in Chiang Mai, Thailand.
Promoting patient-centred care in the management of allergic rhinitis in Asia pacific countries - Expert panel opinion & recommendations

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Background: Patient-centred care involves accounting for the patient’s specific health needs and desired health outcomes. Previous studies have shown that patient-centred approaches have many benefits including improved outcomes & patient satisfaction. The objective of this expert panel was to provide a consolidated view of treatment practices and preferences in the management of allergic rhinitis (AR) and offer opinions on how to optimize patient-centred care in management of AR in the APAC region.

Methods: An expert group of 11 allergists, otorhinolaryngologists and immunologists across Asian countries were surveyed regarding their current treatment practices. The full day meeting included discussion on consensus statement, patient journey & patient centered treatment guide. Recommendations for the implementation of patient-centred care for AR were further discussed by expert group.
Result: All the experts (strongly agreed or agreed) on various statements composed on practices and their perspectives towards improving patient journey in AR. Several patient-factors which impact the implementation of patient-centred care in APAC were identified, including time and financial constraints, lack of awareness of the disease, access to and lack of suitable educational materials, access to specialist medical care and understanding the relevance of treatment adherence.

Conclusion: Suggested solutions comprise seeking an understanding of the patient’s particular healthcare needs and implementing shared decision-making around treatment options. This includes considering patient characteristics such as age and comorbidities, as well as personal preferences. Improving the patient and physician knowledge including timely referral for seeking specialist care was identified crucial for improving patient outcomes.
Background: Allergic rhinitis (AR) is a pervasive health concern, significantly impacting the quality of life for individuals worldwide. In Thailand, the incidence of AR is observably rising, with grass and weed pollen as predominant outdoor triggers. Nevertheless, in tropical/subtropical regions, a notable scarcity of data persists concerning sensitization patterns involving grass and weed pollen. This study aims to investigate the incidence and patterns of sensitization to grass and weed pollen among Thai AR patients.

Methods: In total, 126 AR patients were recruited for skin prick test (SPT) using pollen extracts from five grasses and two weeds. SPT results were recorded and analyzed. Data visualization and statistical analysis were performed to illustrate sensitization patterns as well as co-sensitization among different pollen species.

Result: Of the 126 patients recruited, 104 (82.5%) patients had positive SPT to at least one pollen species. The prevalence of pollen sensitization differed among species, with the Cm pollen extract showing the highest number of positive SPT results (76/126), followed by Um (57/126). Among 104 AR patients with positive SPT, mono-sensitization and poly-sensitization were observed in 27 and 35 patients, respectively. The most common poly-sensitization showed sensitivity to two different pollen extracts.
Moreover, the Venn diagram illustrates that Um-Cm is the most frequently observed co-sensitization pattern, followed by Cd-Cm.

**Conclusion:** Nutsedge, para grass, and Bermuda grass are the primary allergenic pollen species triggering allergic sensitization in Thai AR patients. Sensitization patterns among species could pave the way for advancements in the diagnosis and treatment of pollen-induced allergic diseases among Thai AR patients.
WAC23-0332
Exploring oscillometry potential to evaluate nasal resistance: A Proof of Concept study

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Background: Rhinitis imparts a huge burden to both quantity and quality of life, yet its diagnostic criteria lack objectivity. Techniques like rhinometry are cost-ineffective and inaccessible. We hereby, made a novel attempt to demonstrate nasal airflow resistance (NAR) using oscillometry, a sound-signal based technique to assess lung functions. Objective - To evaluate NAR among subjects with or without rhinitis using oscillometry.

Methods: After IRB clearance, this prospective interventional study was conducted at allergy clinic of a multi-disciplinary hospital in North India. Adults with or without rhinitis (diagnosed with at least two criteria out of rhinorrhea, sneezing, nasal obstruction or pruritus for over a year) were recruited after informed consent and excluding uncontrolled asthmatics or with oro-nasal structural abnormality. Oscillometry was performed with leak-proof nasal mask using ResmonTM Pro FOT machine. Parameters were measured (with closed mouth) at baseline and post-topical vasoconstrictor. Percentage (%) changes in NAR among two groups were evaluated.

Result: 20 participants (mean±SD age 27.86±14.63 years) had comparable baseline characteristics (age, height and body mass index) with 20 controls. NAR was clearly elevated in rhinitis group with greater post-vasoconstrictor reversibility, particularly at 19 Hz. The %change (mean±SD) in inspiratory NAR was significantly higher with moderate-severe (21.05±13.68) versus mild (2.88±2.02) rhinitis cases.

Conclusion: Oscillometry seems to be a good, feasible, safe, available, affordable and reproducible tool for monitoring rhinitis patients. Our work highlights the urgent and unmet need for large multi-centric trials among different phenotypes along with creation of population-based nomograms. Optimal sound frequency estimation for NAR evaluation is potential area of research.
Mobile phone daily alarm to improve compliance of intranasal corticosteroids among allergic rhinitis: A randomised controlled trial.

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Background: Intranasal corticosteroids (INS) effectively manage allergic rhinitis (AR), but forgetfulness is the main reason for non-compliance. Daily mobile phone alarms presents a straightforward solution to INS adherence. This study aims to evaluate the effectiveness of daily mobile phone alarm in improving INS compliance among participants with AR

Methods: Persistent AR adults with mobile phones were enrolled in this randomized controlled trial. The participants were randomized into two interventions groups (mobile alarm group and control group - No mobile alarm reminder). The mobile alarm group received pre-set alarm reminders to use their INS. The weight of the INS bottle was recorded at baseline and after 1 month of INS use. All participants self-reported their INS usage through a compliance card. The main compliance outcome was a 7.6g weight difference before and after treatment, while the secondary outcome was self-reported INS use for at least 20 days in a month

Result: A total of 182 participants were included with mean age of 30.66 ± 9.02 years old. The mobile alarm group were more compliant to INS compared to control group based on weight difference of INS bottle (94.5% vs 79.1%, p=0.02) and also based on self-administered compliance card (100% vs 93.4%, p= 0.01).

Conclusion: Mobile phone daily alarm is an effective method to ensure compliance of INS. This is readily available in all smart phones and has a role in managing AR patients who are newly prescribed INS.
**WAC23-0354**

**The Efficacy of Elonide Intra-Nasal Corticosteroids in Managing Allergic Rhinitis**

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**Background:** Mometasone furoate nasal spray is efficacious in relieving allergic rhinitis symptoms. The objectives of this study are; firstly to compare the efficacy of Elonide to Nasonex® and placebo; and secondly; to investigate the side effects of Elonide.

**Methods:** This was a prospective single centered, double blinded, randomized, placebo-controlled trial. A total of 163 participants were randomized into three treatment groups of Elonide (n=56), Nasonex® (n=54) and placebo nasal sprays (n=53). Treatment was administered for 4 weeks. The primary outcome measure was the Total Nasal Resistance (TNR) and the secondary outcomes were Visual Analogue Score (VAS) and Rhinoconjunctivitis Quality of Life Questionnaire (RQOLQ). Side effects were recorded.

**Result:** There were significant improvement for all groups from baseline. Elonide had the largest improvement in mean difference in VAS (57.09±17.14 vs 33.90±17.80, p<0.01), RQOLQ (2.87±1.17 vs 1.39±0.95, p<0.01) and TNR (1.37±2.55 vs 0.56±0.35, p<0.01) after 4 weeks of treatment. Elonide group had the greatest mean difference for all primary and secondary outcomes compared to Nasonex® and placebo (0.77±2.44 vs 0.35±1.16, p=1.00 vs 0.17±0.82, p=0.01). Elonide is non-inferior to Nasonex (p=1.00) and superior to placebo (p<0.05). The highest side effects reported is Nasonex (n=14, 26%), followed by placebo (n=8, 16%) and Elonide (n=6, 12%); whereby headaches (n=9, 17%) and sore throat (n=9, 17%) were the most common.

**Conclusion:** Elonide has similar efficacy to Nasonex® when compared to placebo in the treatment of AR in adults. Elonide is safe and tolerable with less side effects and no adverse side effects.
Activation of Group 2 innate lymphocytes in nasal polyp from eosinophilic chronic rhinosinusitis

Assistant Professor Yasutaka Yun

Background: Eosinophilic chronic rhinosinusitis (eCRS) is a subtype of chronic rhinosinusitis caused by type 2 inflammation and is highly associated with asthma. Group 2 innate lymphocytes (ILC2) are a major component of type 2 inflammation in humans; ILC2 secrete large amounts of type 2 cytokines such as interleukins 4, 5 and 13 and are significantly associated with host protective innate immunity. However, there are few reports of ILC2 presence and its activation in nasal polyps of eCRS patients. Thus, we evaluated ILC2 activation using a marker of activation, CD69.

Methods: CD69 expression in ILC2 was analyzed from peripheral blood and nasal polyps of eCRS patients by using a flow cytometer, and the correlation with clinical findings was evaluated. In addition, type 2 cytokines in nasal polyps were determined and their correlation with the degree of activation was evaluated.

Result: ILC2 was activated in nasal polyps from eCRS and CD69 was significantly increased compared to ILC2 in peripheral blood from same patient. Furthermore, there was a correlation between the degree of activation and clinical findings and type 2 cytokine production.

Conclusion: The results suggest that ILC2 in the nasal polyps from eCRS is activated and releases type 2 cytokines, affecting other inflammatory cells such as eosinophils. Control of ILC2 activation was considered important in the regulation of type 2 inflammation.
Dupilumab in refractory eosinophilic chronic rhinosinusitis: an observational study on clinical outcome and type 2 inflammatory biomarkers

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Background: Dupilumab, an anti-monoclonal antibody for interleukin-4 receptor alpha, is a new treatment option for severe uncontrolled chronic rhinosinusitis with nasal polyps. However, data on clinical response and biomarker changes in practice are lacking, and the optimal patient population for dupilumab therapy remains unclear. We sought to investigate the real-life clinical efficacy of dupilumab and its influence on biomarkers in patients with eosinophilic chronic rhinosinusitis, which is a refractory subtype.

Methods: We conducted an open-label, prospective, observational, single-centre study on 63 patients with refractory eosinophilic chronic rhinosinusitis based on the criteria of the Japanese Epidemiological Survey of Refractory Eosinophilic Chronic Rhinosinusitis Study. These patients had a previous history of surgery and received dupilumab for 24 weeks. Patient-reported sinonasal symptoms, nasal polyp score and type 2 inflammatory biomarkers were evaluated.

Result: The visual analogue scale for sinonasal symptoms, including nasal discharge, nasal obstruction, post nasal drip, loss of smell and quality of life deficits, improved promptly and significantly after the initiation of dupilumab(P<0.0001). Dupilumab significantly and immediately decreased nasal polyp score(P<0.0001). There was a significant decrease in total IgE(P<0.0001), thymus and activation-regulated chemokine(P<0.0001) and fractional exhaled nitric oxide concentration(P<0.0001) but not in blood eosinophils by 24 weeks after initiation of dupilumab.

Conclusion: Dupilumab can significantly improve sinonasal symptoms and clinical findings in refractory eosinophilic chronic rhinosinusitis after sinus surgery.
WAC23-0074
Allergic fungal sinusitis-like syndrome

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Background: Allergic fungal sinusitis (AFS) is a noninvasive subtype of sinusitis with nasal polyps. The diagnostic criteria were type 1 hypersensitivity to fungus, allergic mucin, fungal hyphae in mucus, multiple nasal polyps, and characteristic CT findings. Some authors identified cases that were clinically similar to AFS when type 1 hypersensitivity to fungus was confirmed but there was no fungus in the mucus, or when fungi were confirmed in the mucus but type 1 hypersensitivity to fungi was not confirmed. It was defined as an AFS-like syndrome.

Case study: A 33-year-old female presented to clinic with a left nasal obstruction. She had no history of atopy, asthma, or aspirin hypersensitivity. CT showed a high-density lesion extending from the sphenoid sinus to the ethmoid sinus. Serum IgE levels were elevated (1142 μg/L), and skin prick tests revealed positive reactions to various allergens but not for fungus. AFS-like syndrome was suspected, and endoscopic sinus surgery was performed. During the surgery, multiple polyps and brownish, sticky mucus was found extending from the sphenoid sinus to the ethmoid sinus. Gomori's methenamine silver staining revealed eosinophilic infiltration. Postoperative medications included cephalosporin and macrolide antibiotics followed by a tapering dose of prednisolone and topical steroid sprays. During follow-up, no signs of recurrence were observed.

Conclusion: In Korea, AFS cases that meet all diagnostic criteria are still relatively rare, with fewer than 20 cases reported. If AFS or AFS-like syndrome is suspected clinically, considering systemic steroid therapy after surgical removal can be beneficial.
The causal relationship between MT3 expression and depleted mucosal zinc level in chronic rhinosinusitis with nasal polyps.

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Background: Mucosal zinc depletion was found in chronic rhinosinusitis with nasal polyps (CRSwNP). The mechanism leading to the depletion, however, is still unknown. Among zinc transporters and chelators, only was Metallothionein (MT) 3 found as altered gene expression in CRSwNP. MTs, whose expression is positively regulated depending on intracellular zinc, simultaneously function as an intracellular chelator so that decrease zinc. In this study, we sought to investigate whether the altered MT3 expression could be a cause for or just a result of the depleted zinc level in CRSwNP.

Methods: Tissue zinc level and MT3 expression were semi-quantified with immunofluorescence microscopy and zinquin on a tissue microarray (TMA) slide consisting of nasal mucosa of healthy volunteers and patients with CRSsNP or CRSwNP. Also, nasal epithelial cells (HNECs) were cultivated in a zinc-depleted medium, followed by an evaluation of MT3 protein expression.

Result: TMA analysis showed decreased expression of MT3 in CRSsNP and CRSwNP, as well as depleted tissue zinc levels in both conditions. A significant positive correlation was found between zinc intensity and MT3 intensity (r=0.45, p<0.01). The in vitro analysis demonstrated MT3 fluorescence intensity were significantly depleted in zinc-depleted cells (0.63-fold change, p<0.01). A significant positive correlation was found between zinc and MT3 intensity within individual cells (r=0.59, p<0.001).

Conclusion: MT3 expression well reflects zinc level in the nasal mucosa, suggesting the altered gene expression is the result of, not the cause for, the depleted zinc level in CRSwNP.
WAC23-0100
Impact of aeroallergen on chronic rhinosinusitis according to allergen type

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Background: Many prior investigations have explored the relationship between allergic rhinitis and chronic rhinosinusitis (CRS), but the findings were inconsistent. This study aims to investigate the differences in CRS development based on sensitization to aeroallergen types.

Methods: This retrospective study includes 188 patients diagnosed with CRS in 2019~2022, who underwent paranasal sinus computed tomography (PNS CT), multiple allergen simultaneous tests, serum total immunoglobulin E (IgE) tests, and serum eosinophil tests. The patients were divided into four groups: no allergy (group A), HDM allergy (group B), pollen allergy (group C), and both allergies (group D). Clinical findings were compared among the groups.

Result: No significant differences were found in CRS-related symptoms, endoscopic and CT findings, and olfactory function between group A and B, group A and C, and group B and C. However, CRS patients sensitized to pollens showed a tendency to experience less subjective loss of smell and olfactory dysfunction compared to non-sensitized or HDM-sensitized CRS patients, although not statistically significant. In group D, CT findings and olfactory dysfunction were significantly more severe compared to group A and to group C. Comparing group D with group B, the prevalence of nasal polyps, CT score, and eosinophil cationic protein level were significantly higher in group D.

Conclusion: Patients sensitized to both HDM and pollens exhibit more severe CRS and are more likely to experience olfactory dysfunction. Therefore, individuals simultaneously sensitized to multiple common aeroallergens should receive careful attention to prevent CRS and should be treated with customized approaches when CRS develops.
Precise Identification of Eosinophilic Chronic Rhinosinusitis: Comparative Analysis of Diagnostic Criteria and Development of a Novel Scoring System

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Background: Accurate diagnosis of Eosinophilic chronic rhinosinusitis (ECRS) is crucial due to its distinct treatment approach and prognosis. This study aims to validate the accuracy of four diagnostic criteria for ECRS and type 2 inflammation, as outlined in previous studies.

Methods: This retrospective study, conducted at a single center, analyzed data from 669 patients with chronic rhinosinusitis who underwent endoscopic sinus surgery. A cutoff value of 70 eosinophils per high-power field was utilized to categorize patients into ECRS or non-ECRS groups. The four diagnostic criteria were compared using receiver operating characteristic curves, and a novel diagnostic scoring system was developed using binary logistic regression.

Result: Significant differences were observed between ECRS and non-ECRS groups in terms of the presence of nasal polyps, mean Lund-Mackay scores of the anterior and posterior ethmoid sinuses on both sides, and blood eosinophil proportion. The weighted scoring system, incorporating these three predictors, demonstrated higher accuracy (sensitivity: 62.6%; specificity: 85.5%; area under the curve [AUC]: 0.842) compared to JESREC (AUC: 0.770), EPOS (AUC: 0.649), Y. Sakuma et al. (AUC: 0.600), and EUFOREA (AUC: 0.553).

Conclusion: A novel scoring system based on three simple objective clinical factors exhibited stronger correlation with the final pathology results of ECRS when compared to diagnostic criteria from previous studies. This scoring system holds promise as a reliable tool for the precise identification of ECRS, aiding in appropriate treatment strategies and improved patient outcomes.
**WAC23-0148**

**Dupilumab improves nasal obstruction in patients with chronic rhinosinusitis with nasal polyps, irrespective of gender**

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**Background:** Dupilumab has demonstrated efficacy in patients with severe chronic rhinosinusitis with nasal polyps (CRSwNP), and was generally well tolerated. The efficacy of dupilumab by gender has not been reported. Objective: To assess baseline characteristics and dupilumab efficacy by gender in patients with severe CRSwNP from the SINUS-52 study (NCT02898454).

**Methods:** This post-hoc analysis included all patients randomized to placebo or dupilumab 300 mg every 2 weeks. Efficacy was assessed using nasal polyp score (NPS; range 0–8) and nasal congestion score (NC; 0–3).

**Result:** Of 303 patients, 192 (63%) were male and 111 (37%) were female. Baseline disease characteristics were generally similar in male and female patients except that coexisting asthma (78% vs 46%) and non steroidal anti-inflammatory drugexacerbated respiratory disease (39% vs 19%) were more frequent in females than males. Baseline NPS and NC scores were similar between male and female patients. Least squares mean differences [95% confidence interval] in change from baseline at Week 52 were: NPS −2.33 [−2.80, −1.86] in male and −2.54 [−3.18, −1.90] in female patients (both P <0.0001); NC −0.87 [−1.10, −0.64] in male and −1.19 [−1.50, −0.88] in female patients (both P <0.0001). Significant improvements in NPS and NC were observed from the first assessment at Week 4 in both male and female patients (all P <0.0001 except NC for female patients, where P <0.01). The safety of dupilumab was consistent with its known safety profile.

**Conclusion:** Dupilumab treatment was associated with significant improvements in NPS and NC irrespective of gender.
Dupilumab improved objective and patient-reported outcomes in patients with chronic rhinosinusitis with nasal polyps and complete bilateral nasal obstruction in the SINUS-24 and SINUS-52 trials

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Background: In chronic rhinosinusitis with nasal polyps (CRSwNP), nasal polyp score (NPS) of 8/8 signifies complete nasal obstruction. Dupilumab is efficacious in severe CRSwNP; here we report outcomes in patients with NPS=8.

Methods: Post-hoc analysis of patients with NPS=8 at randomization in SINUS-24/SINUS-52 (NCT02912468/NCT02898454), receiving dupilumab 300 mg/placebo q2w. Assessments: NPS (0−8), peak nasal inspiratory flow (PNIF), Lund–Mackay computed tomography (LMK-CT; 0−24), nasal congestion, loss of smell (NC, LoS; 0−3), 22-item Sino-Nasal Outcome Test (SNOT-22; 0−110).

Result: 98/724 (13.5%) patients had baseline NPS=8 (placebo/dupilumab, 30/68). Mean (SD) baseline PNIF (L/min), LMK-CT, NC, LoS, SNOT-22 were 33.8 (45.1), 18.9 (3.9), 2.7 (0.4), 2.9 (0.3), 56.9 (21.6), respectively. All assessments improved with dupilumab versus placebo at Week (W)24 (least squares mean difference [95% CI]): NPS −2.04 [−2.67, −1.40], PNIF 65.9 [39.4, 92.4], LMK-CT −4.97 [−6.50, −3.44], NC −1.30 [−1.72, −0.89], LoS −0.96 [−1.39, −0.54], SNOT-22 −25.3 [−34.1, −16.4], with similar results at W52. At W24, 69.1%/10.0% patients (dupilumab/placebo) achieved NPS improvement ≥1; 51.5%/0% LMK improvement ≥5; 73.5%/16.7% NC improvement ≥1; 60.3%/20.0% LoS improvement ≥1; all p< 0.0001; 73.5%/40.0% SNOT-22 improvement ≥8.9 (p=0.0010).

Conclusion: In CRSwNP patients with complete bilateral nasal obstruction, dupilumab treatment demonstrated significant, clinically relevant reduction in NPS, and improved nasal inspiratory flow, symptoms, and health-related quality of life.
Predictors of response to biologics in severe asthma

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Background: Biologic therapies have been identified as an effective treatment for severe asthma, that improve patient clinical response, lung function and asthma symptom control.

Methods: A retrospective single-center cohort study of 152 patients with severe asthma who started biologic therapy; their data were retrieved from medical records for further analysis.

Result: Childhood-onset asthma, bronchiectasis, and maintenance oral corticosteroid (mOCS) use were significantly associated with poor response to omalizumab and benralizumab. However, chronic rhinosinusitis, poor symptom control (ACT below 19), severe airway obstruction (<60% predicted), and IgE<220kIU/L were associated with higher poor response rates to omalizumab (p=0.01, 0.01, 0.05 and 0.04, respectively). At the same time, female patients, and those with blood eosinophils level < 500 cells/mm³ had a higher poor response rate to benralizumab (p=0.05 and 0.04, respectively). Ischemic heart disease (IHD), bronchiectasis, and continued use of OCS increased the likelihood of poor response to omalizumab by 21, 7, and 24 times (p=0.004, 0.008, and 0.004, respectively).

Conclusion: Poor response to omalizumab was independently predicted by IHD, bronchiectasis, and mOCS. However, poor response to benralizumab was independently influenced by being female sex with higher BMI.
Dupilumab is safe and effective in Asian adolescents and young adults with atopic dermatitis: a case series from Singapore

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Background: Dupilumab is a monoclonal antibody targeting IL-4 and IL-13 receptors for treatment of atopic dermatitis (AD). We aim to describe a series of Asian adolescents and young adults (AYA) who received Dupilumab in a Singapore tertiary centre.

Methods: Clinical charts of AYA patients started on Dupilumab from February 2020 to January 2023 were retrospectively reviewed to collect data pre- and post-Dupilumab treatment up to 1 year. SCORing Atopic Dermatitis (SCORAD) and Dermatology Life Quality Index (DLQI) were obtained at each review.

Result: Seven AYA patients, aged 11 to 29 years, received Dupilumab. Majority were males (86%) and Chinese (86%). Prior to commencement, all received mid to high potency topical steroids; four (57%) received disease-modifying anti-rheumatic drugs. All received systemic steroids and antibiotics previously; two patients (29%) had complications of steroid toxicity. Mean SCORAD was 61.6+/−24.1 and DLQI was 16+/−8 at baseline. Mean decrease in SCORAD from baseline was 31.0+/−9.1(p<0.001), 32.9+/−11.5(p=0.001) and 34.9+/−18.0(p=0.005) at 8, 26 and 52 weeks post-initiation respectively. Mean decrease in DLQI from baseline was 10+/−7.5(p=0.037), 8+/−4.3(p=0.034) and 10+/−3.8(p=0.001) at 8, 26 and 52 weeks respectively. Stable SCORAD and DLQI scores were observed despite tapering Dupilumab after 18 to 26 weeks postinitiation to a dosing interval of four to six weeks, after a period of controlled disease. None had adverse reactions.

Conclusion: Significant improvement in AD can be seen as early as four weeks post-Dupilumab initiation. Dupilumab is safe and effective in Asian AYAs with AD. Dupilumab response was sustained despite increasing dosing intervals to four and six weeks following a period of optimal AD control.
Local Sensitization to Aspergillus sp. in Patients with Allergic Fungal Rhinosinusitis

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Background: Allergic Fungal Rhinosinusitis (AFRS) is a complex disorder that affects the sinuses and airways with a heavy and long-term symptoms. The diagnosis of sensitization to fungus among patients with fungal rhinosinusitis (FRS) mostly depends on skin prick test (SPT). However, SPT could not detect local (nasal) sensitization to fungus. This study aimed to investigate the prevalence of local sensitization in the comparison to systemic sensitization to Aspergillus sp. among patients with FRS.

Methods: A cross-sectional study included 200 patients with FRS, who were infected by Aspergillus sp. The diagnosis was confirmed by CT scan and pathological findings. Skin prick test (SPT) and nasal provocation test (NPT) with Aspergillus sp. were performed.

Result: Female (64.5%) were predominant. Mean age of the study subjects were 56.01 ± 14.06. 58/200 (29.0%) FRS patients had positive NPT results and 34/200 (17.0%) had positive SPT results. Interestingly, 30/34 (88.2%) of FRS patients with positive SPT also had positive NPT results, while only 28/58 (48.3%) of FRS patients with positive NPT also had positive SPT results. Patients with positive NPT and/or SPT results were diagnosed as AFRS (n=62). Patients with AFRS had symptoms more frequently compared to those with non-AFRS, including nasal blocking, runny nose, sneezing, itchy nose, itchy and eyes.

Conclusion: Nasal provocation test could detect more patients with AFRS compared to SPT, which was due to the local sensitization to fungus. The combination of SPT and NPT could be necessary for diagnosis of AFRS. Patients with AFRS had more symptoms of rhinosinusitis compared to non-AFRS patients.
WAC23-0224
Exploring differential expression of small RNAs in exhaled breath condensate between chronic rhinosinusitis with nasal polyp patients with and without asthma

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Background: Asthma is an important comorbidity for the patients with chronic rhinosinusitis with nasal polyps (CRSwNP). However, the pathophysiological mechanisms behind which patients with CRSwNP have asthma and which patients do not, remain unknown. We aimed to explore the differential expression of small RNAs in exhaled breath condensate (EBC) between CRSwNP patients with and without asthma.

Methods: Participants scheduled for surgery due to CRSwNP who consented to the study were recruited and their EBC were collected. EBC samples were gathered from 43 subjects, and a total of 231 small RNAs were profiled from the EBC samples. Affymetrix GeneChip miRNA 4.0 Array platform was used for EBC analysis. Statistical analyses were performed using Affymetrix Power Tools and R 3.3.3.

Result: Among the 43 participants, 29 had no asthma (NA group), while 14 had asthma (A group). Age, Lund-Mackay score, lung function, fraction of exhaled nitric oxide, and serum total IgE did not differ significantly between the groups. Peripheral blood eosinophil count was significantly higher in the A group compared to the NA group (A vs. NA groups = 436 ± 514/μL vs. 322 ± 643/μL, p = 0.04). There were 10 differentially expressed small RNAs. Among these, hsa-miR-6748-5p, hsmiR-6794-5p, hsa-miR-6858-5p, ENSG0000238565, ENSG0000238852, and hsa-mir-6886 exhibited increased expression, while hsa-miR-548x-3p, ENSG0000238486, ENSG0000251737, and hsa-mir-4529 showed decreased expression in the A group.

Conclusion: Differences in the expression of small RNAs in EBC were observed between the two groups. Further investigations are warranted to elucidate the specific biological roles of these small RNAs.
WAC23-0242
Clinical significance of eosinophil counts in nasal polyp tissues in patients with chronic rhinosinusitis accompanied by asthma

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Background: This study aimed to evaluate the prognostic significance of eosinophil counts in nasal polyp tissue for ongoing management selection in patients with chronic rhinosinusitis (CRS) and asthma, who commonly face recurrence postoperation and require sustained care.

Methods: Patients with asthma undergoing endoscopic sinus surgery (ESS) for CRS with nasal polyps and biopsy were included. Eosinophil counts were measured in 45 patients' nasal polyp biopsies at 400x magnification, alongside follow-up endoscopic findings and symptom scores. Demographics, blood/allergy test results, physical exams, CT scans, symptoms, and JESREC scores were retrospectively assessed. Clinical features and post-ESS disease recurrence were examined.

Result: Patients were categorized into eosinophil count groups: \( \geq 70 \) and <70. High eosinophil group had 24 patients; low eosinophil group, 21. Groups showed no significant differences in age, BMI, underlying diseases, smoking, drinking, or prior nasal surgery history. High eosinophil group had significantly more females (70.8%, \( p=0.03 \)). Pre-op findings, symptom/endoscopic/CT scores, and JESREC scores had no significant intergroup differences. At 6 months post-surgery, high eosinophil group had notably higher Lund-Kennedy endoscopy scores (2.09±2.02) than low eosinophil group (0.50±0.76) (\( p=0.002 \)). When categorized based on CRS control, 73.7% in high eosinophil group and 26.3% in low eosinophil group were in non-control group (\( p=0.03 \)). Other factors like blood eosinophil count, pre-op endoscopy/CT findings, and JESREC score, showed no significant differences.

Conclusion: In CRS patients with asthma, higher tissue eosinophil counts in nasal polyps were associated with poorer disease control post-ESS, making it a more potent predictor of prognosis than other clinical factors.
Does the anatomy of the Frontal Recess play a role in the pathogenesis of chronic Frontal sinusitis - A three dimensional Radiological Study using Computerised Tomography

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Background: An acute infection of the frontal sinus may turn into a chronic disease based on the interaction of agent, environment and host factors. Amongst the host factors which predispose an individual to chronic frontal sinusitis is the anatomy of the frontal recess region. Our study looked at the relation of these cells along with the dimension of the frontal recess region and its implications in the pathogenesis of chronic frontal sinusitis.

Methods: The study was a retrospective and prospective case control study with fifty controls and fifty cases and was conducted from Nov 2012 to October 2013 at the Department of ENT, Christian Medical College, Vellore, India. Institutional Review Board Ethical Committee clearance was obtained before the study. The CT images of both the groups were analysed with the help of a radiologist and were compared. The findings were documented and analysed using STATA/IC 10.1 software package.

Result: In this study we could not find a significant relation for any particular frontal cell or pneumatization pattern for being the sole cause for chronic frontal sinusitis.

Conclusion: Pneumatization pattern in combination with other factors like virulence of the causative agent and environmental factors predispose an individual to chronic frontal sinusitis.
WAC23-0341
The sensitisation to staphylococcal enterotoxin and the severity of chronic rhinosinusitis

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Background: Evidence is accumulating that Staphylococcus aureus plays an important role as a disease modifier in upper and lower airway disease. We aimed to assess the association of staphylococcal enterotoxins (SEs) with allergic multimorbidity as well as the severity of chronic rhinosinusitis.

Methods: We retrospectively reviewed the medical records of 97 subjects aged 6 years or older between March 2018 and June 2019 and analysed symptom scores, computed tomography scores, serum IgE levels to SEs, serum total and specific IgE levels to inhalant allergens. To evaluate eosinophilic chronic rhinosinusitis (ECRS), we used refractory ECRS score from the Japanese epidemiological survey.

Result: Of the 97 patients enrolled, 29 (29.9%) were non-sensitised, 33 (34.0%) were mono-sensitised, and 35 (36.1%) were poly-sensitised. Sensitisation to SEs was closely associated with poly-sensitisation to inhalant allergens. SE-sensitised participants had higher median values for total and specific IgE levels to inhalant allergens than did non-SE-sensitised participants. SE sensitisation was associated with allergic multimorbidity and severe allergic diseases, such as ECRS.

Conclusion: This preliminary study suggested that sensitisation to SEs may play a role in the initiation of type-2 inflammatory responses, such as allergic rhinitis, ECRS, and allergic multimorbidity. Furthermore, sensitisation to SEs correlated with the severity of ECRS.
The Profile of Allergic Rhinitis in Patients with Chronic Rhinosinusitis

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Background: Around 5-12% of the general population worldwide experience chronic rhinosinusitis (CRS) daily. CRS frequently coexists with allergic rhinitis and other respiratory illnesses. However, the contributions of allergies as co-morbidity vary in some literature. The objective of this study was to identify the profile of allergic rhinitis in CRS patients and establish any allergy characteristics within various phenotypes of the condition.

Methods: A retrospective study at a tertiary hospital was conducted. According to the history and clinical examination, patients were classified as having CRS with nasal polyp (CRSwNP) or without nasal polyp (CRSsNP). Skin prick tests against common allergens were performed on all patients. The 22-item Sino-Nasal Outcome Test (SNOT-22), Lund-Mackay (LM) score of computed tomography scan of paranasal sinuses, and allergic rhinitis symptoms were evaluated.

Result: A total of 14 patients were enrolled; 6 CRSwNP patients and 8 CRSsNP patients. Twelve (85.71%) of the patients had positive skin prick tests for at least one of the common allergens. The most common aeroallergen sensitivity was seen with house dust mites in 11 (91.67%) patients. Patients of CRSwNP with atopy had higher mean Lund Mackay score and SNOT-22 score than CRSsNP with atopy and nonatopic patients which was statistically significant.

Conclusion: The prevalence of allergy is high in CRS patients. The clinical and radiological disease burden is greater in CRS with allergy. The protocol for diagnosing CRS should include testing for allergy sensitivity. For a better result, allergies must be treated as effectively as possible.
A case of mepolizumab-resistant Kimura's disease responding to dupilumab

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Background: There is no consensus on the therapeutic target molecule for treating Kimura's disease when patients are resistant to steroids and immunosuppressive agents.

Case study: The case involves a 14-year-old boy referred to the hospital due to the rapid growth of a subcutaneous mass on his left upper arm, which appeared at 5. The patient also had eosinophilia with a high eosinophil count of 12455/µL and elevated serum IgE levels of 8382 IU/mL. Biopsy histology confirmed the diagnosis of Kimura's disease, and the patient also met the criteria for eosinophilic granulomatosis with polyangiitis (EGPA). The mass decreased in size, and eosinophil count decreased following tumor excision surgery and prednisone (PSL) treatment. However, during the tapering of PSL, the patient developed left eyelid swelling and left ocular protrusion, with imaging showing hypertrophy of the left lateral rectus muscle. Increasing PSL dosage and combination therapy with cyclosporine and methotrexate were effective, but at the age of 13, a new mass appeared on the right forearm. Mepolizumab indicated for EGPA, was administered, but the mass did not shrink and increased after a novel coronavirus infection. The patient was then switched to dupilumab after an ethics review, which resulted in the shrinkage of the mass.

Conclusion: Cytokines such as IL-4, IL-5, and IL-13 produced by Th2 cells are believed to be involved in the pathogenesis of Kimura's disease. Dupilumab has shown efficacy in multiple eosinophilic diseases, and there have been scattered reports of adult patients with omalizumab-refractory Kimura's disease who have responded to dupilumab. Targeting IL-4/13 may be effective in the treatment of Kimura's disease.
Recombinant human diamine oxidase prevents haemodynamic effects of histamine in guinea pigs

Background: Histamine is the main mediator in anaphylaxis, acute infusion reactions, chronic spontaneous urticaria and other conditions. Current treatment options are insufficient so that new therapeutic approaches to counteract histamine are urgently needed. Recombinant human diamine oxidase (rhDAO) rapidly degrades histamine and is the first molecule preventing histamine action simultaneously on all four receptors. The aim of this study was to test whether rhDAO can alleviate cardiovascular responses to histamine.

Methods: Guinea pigs received 4 mg/kg rhDAO or buffer followed by a continuous infusion of 8 mcg/kg/min histamine. Heart rate (HR) and mean arterial pressure (MAP) were measured.

Result: Histamine infusion increased mean peak plasma histamine levels from 5 (±0.3 SEM) to 28 ng/mL (±4.9 SEM) after 30 minutes. Infusion of rhDAO lowered histamine plasma concentrations (p=0.002), and also reduced urinary histamine (p=0.004) and 1-methylhistamine (p<0.0001) excretion. rhDAO prevented tachycardia (p=0.008) and mitigated the fall in body core temperatures (p=0.02) compared to controls. Cessation of histamine infusion led to a rebound increase in MAP, but this haemodynamic instability was abrogated by rhDAO.

Conclusion: Prophylactic infusion of rhDAO prevents haemodynamic effects of histamine in guinea pigs, the only fairly histamine sensitive rodent species. These findings will help in the translation from animals to humans and in the selection of optimal dosing of rhDAO during human histamine challenge studies. The data demonstrate that rhDAO is a promising therapeutic approach for the treatment of anaphylactic reactions, but also other histamine mediated diseases when conventional antihistamines fail.
ZB-168 potently inhibits thymic stromal lymphopoietin mediated inflammation

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**Background:** Thymic stromal lymphopoietin (TSLP) is an epithelial cell-derived cytokine synthesized in response to various stimuli including allergens and invading pathogens. Biological functions of TSLP require heterodimer formation between the TSLP receptor (TSLPR) and IL-7 receptor-a (IL-7Ra), which polarize dendritic cells to induce type 2 inflammation and directly expand and/or activate Th2 cells, group 2 innate lymphoid cells, basophils, and other immune cells. Stimulation with TSLP has previously been shown to potently induce thymus and activation-regulated chemokine (CCL17/TARC) and macrophage-derived chemokine (CCL22/MDC) which recruit T cells to the site of inflammation. This study evaluated the potency of ZB-168, a fully human anti-IL-7Ra antibody, in TSLP-mediated chemokine production.

**Methods:** Whole blood was collected from 3 healthy donors for use in these studies. Purified CD14+ monocytes were subsequently stimulated with TSLP in the presence/absence of ZB-168 (anti-IL-7Ra), anti-TSLPR, or anti-TSLP for 24 hours. Levels of CCL17/TARC and CCL22/MDC were assessed in culture supernatants using a Quantikine ELISA. All participants provided written consent before enrollment.

**Result:** TSLP dose-dependently stimulated the secretion CCL17/TARC and CCL22/MDC. Treatment with ZB-168 significantly inhibited the TSLP-mediated induction of CCL17/TARC and CCL22/TARC in a dose-dependent manner with IC50s of 0.05nM and 0.07nM, respectively. In comparison, the IC50s for anti-TSLP and anti-TSLPR were significantly greater than ZB-168.

**Conclusion:** These studies demonstrate that ZB-168 (anti-IL-7Ra) potently inhibits TSLP mediated inflammation and warrants further clinical exploration in TSLP mediated inflammatory diseases.
**WAC23-0243**

**Dupilumab Efficacy and Co-Morbidity Impact in Severe Atopic Dermatitis: A Comprehensive Study**

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**Background:** Atopic Dermatitis (AD), a chronic inflammatory skin disorder affecting over 230 million individuals worldwide, imposes significant morbidity and the highest quality of life impact among skin conditions. This study aimed to evaluate treatment response and the impact on co-existing T2 comorbidities in patients with severe AD treated with dupilumab (anti IL4Ra).

**Methods:** Patients with uncontrolled AD were treated with dupilumab 300mg/2w (initial dose 600mg) at the "D. Kalogeromitros" Allergology unit, University General Hospital 'Attikon', Athens, Greece (03/2020 - 06/2022). Assessments were conducted at baseline (w0) and weeks 2, 4, 16, 24, and 52, encompassing SCORAD, EASI, IGA, DLQI scores, and peripheral blood eosinophils (w0, w16, w52). Patients with comorbid asthma and/or allergic rhinitis were additionally assessed with FeNO, ACT, and FEV1. The study also examined systemic steroid and cyclosporine intake, nasal symptoms, and food allergy-related factors.

**Result:** Eight patients were included (co-existing diseases: 5/8 asthma GINA step 1-4, 3/8 AR, 3/8 FA), with baseline severe disease and reduced quality of life (mean scores: SCORAD 58.8±17.6, EASI 28.3 ± 12.1, IGA 3, DLQI :27 ± 3). Impressive responses were observed after two weeks of Dupilumab, with reductions in SCORAD, EASI, IGA, and DLQI scores, improved lung function in asthma patients, and decreased FeNO levels. While most patients experienced positive outcomes, one patient encountered a flare-up, discontinuing treatment at week 32, and another discontinued at week 12 due to adverse events.

**Conclusion:** Blocking IL4 and IL13 pleiotropic action through dupilumab significantly controlled type 2 inflammation, offering notable AD improvements and additional benefits for co-existing asthma patients. Rigorous monitoring of biologic treatment efficacy and safety remains vital.
Severe Allergic Asthma, Sarcoidosis and Omalizumab: a case report

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Background: Sarcoidosis is one of the alternative diagnoses in the differential diagnosis of severe asthma. Rarely, severe asthma may be accompanied by sarcoidosis. A case in which these two conditions coexisted and omalizumab was used in the treatment is presented.

Case study: Fifty-three-year-old female patient. Eight years ago, omalizumab was started at 300 mg /4 weeks due to severe allergic asthma. The patient was examined 3 years ago for fever erythema nodosum. He was diagnosed with sarcoidosis after fiberoptic bronchoscopy. When the old radiology of the patient was examined, it was seen that he had bilateral hilar lymphadenopathies before omalizumab was started. The patient's symptoms improved after short-term oral corticosteroid therapy. Omalizumab treatment was interrupted for 8 months at the request of the patient. However, when asthma control was lost, omalizumab was started again and asthma was controlled. Currently, omalizumab treatment is continued.

Conclusion: Rarely, severe allergic asthma and sarcoidosis can be seen together. In this case, omalizumab can be used in the treatment of severe allergic asthma if there is an indication.
Successful Treatment of Eosinophilic Myocarditis Following Covid-19 Vaccination Using Benralizumab

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Background: Benralizumab, a monoclonal antibody targeting interleukin-5 receptors on basophils and eosinophils, has been implicated in NK-cell mediated eosinophilic apoptosis and has demonstrated efficacy in suppressing tissue eosinophilia across various trials. This report highlights a case of eosinophilic myocarditis in an adult following Covid-19 vaccination, effectively managed with Benralizumab.

Case study: A 21-year-old male, one year post-cadaveric cardiac transplant, has presented with an acute progressive dyspnea over two days. Notably, he had received a Covid-19 mRNA vaccine two weeks earlier. Physical examination revealed respiratory distress, fine lung crackles, and subsequently ventilatory support. A clinical diagnosis indicated acute decompensated heart failure. Eosinophilia was absent in blood test. Echocardiogram demonstrated a significantly decrease in left ventricular ejection fraction (LVEF) from 70% to 10%. Endomyocardial biopsy confirmed eosinophilic myocarditis without acute graft rejection. Initial treatment comprised intravenous methylprednisolone for three days, yielding no clinical improvement. Subsequently, subcutaneous administration of Benralizumab (30 mg) was initiated. Within one day, LVEF rose abruptly to 40%, allowing ventilator weaning and discontinue. With Benralizumab, 30 mg subcutaneously every 4 weeks over a three-month follow-up, he experienced no complication and resumed normal daily activities.

Conclusion: This case highlights the potential of Benralizumab as a therapeutic option for eosinophilic myocarditis linked to COVID-19 mRNA vaccination, even in the absence of eosinophilia. Notably, this case report contributes to the understanding that Benralizumab could effectively alleviate tissue eosinophilia in steroid non-responsive patients. Further research is warranted to validate these findings and explore the broader implications of Benralizumab in similar scenarios.
Real-world local experience with Dupilumab treatment for Type 2 Inflammatory Diseases in paediatric, adolescent and adult patients in center Argentine

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**Background:** Type 2 inflammation underlies different aspects of immune dysregulation seen in atopic dermatitis (AD), asthma and rhinosinusitis with nasal polyposis (RSCcPN). IL4/13 cytokines play a role in its pathogenesis by driving systemic inflammation. The objective is to describe the systemic impact of dupilumab in patients with type 2 inflammatory diseases treated in Allergy and Immunology medical center in Parana, Argentina.

**Methods:** Retrospective observational study to review the medical records of patients with moderate-severe AD, severe asthma and severe RSCcPN older than 6 years on treatment with dupilumab (anti-IL4) for more than 12 months. Describe demographic, clinical, laboratory, comorbidities, disease control, and safety and efficacy data.

**Result:** A total of 12 patients (9 Moderate/Severe AD, 2 severe asthma and RSCcPN and 1 RSCcPN), mean age 37 years, 67% women, mean 21 years of disease evolution. 100% have a history of allergic rhinitis and 87% of atopy march, allergic conjunctivitis, among others. 58.3% underwent immunotherapy in childhood. All had increased IgE and eosinophilia values and were sensitized to aeroallergens. Previous treatments: 66% systemic corticosteroids and 50% immunosuppressants in AD (9 months). Severity scales improved 75% at 24 weeks and 90-100% at 104 weeks with dupilumab. Patients with asthma and RSCcPN without adverse reactions, in AD 22% ocular pruritus and facial erythema, one arthralgia patient.

**Conclusion:** Type 2 disease comprises multiple pathologies with clinical polymorphism. The data presented in this study with Dupilumab are similar to the clinical trials presented. It is important to generate local data in Argentine.
The Role of Rho GTPase Signaling on Epithelial-Mesenchymal Transition and Inflammation of Chronic Rhinosinusitis with Nasal Polyp

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Background: Epithelial to mesenchymal transition (EMT) is a hallmark of chronic rhinosinusitis with nasal polyp (CRSwNP). Rho GTPase is critical for the induction of EMT, however its function in CRSWNP is not entirely understood. We aim to evaluate the role of Rho GTPase signaling in EMT of CRSWNP using human nasal epithelial cells (HNECs), murine nasal polyp (NP) model and human tissues.

Methods: Human nasal epithelial cells (HNECs) treated with TGF-B1 and Rho GTPase signaling inhibitor, Ehop-016 were examined for morphological alterations and EMT-related mediators. Inflammatory markers and EMT related molecules were assessed in murine NP models treated with Ehop-016. Human sinonasal tissues from patients with non eosinophilic and eosinophilic CRSwNP and control were used to analyze EMT markers and Rho GTPase associated mediators.

Result: The HNECs’ morphology restored to its original state and EMT markers were inhibited significantly after EHop-016 treatment. Inhibition of Rho GTPase signaling via EHop-016 resulted in significant decreased of polyoid lesions, significant reduction of EMT and Rho GTPase associated molecules, inflammatory cell infiltration in nasal mucosa and mRNA levels of IL-4, IL-5, IL-6 and IL10. Moreover, Rho GTPase associated molecules were significantly upregulated in CRSwNP samples compared to the control suggesting increased Rho GTPase signaling and EMT in CRSwNP.

Conclusion: Rho GTPase signaling may be implicated in NP pathogenesis via EMT and inflammation. Inhibition of Rho GTPase signaling can be a possible therapeutic strategy for patients with CRSwNP.
WAC23-0301

Human IgE binding epitope identification of tropomyosin allergen (Per a 7) of American cockroach (Periplaneta americana)

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Background: Cockroaches contain several proteins that are allergic to many individuals. However, little is known about the molecular characteristics of cockroach allergens. The aim of this study is to identify the human IgE binding epitopes of tropomyosin allergen (Per a 7), a significant allergen found in American cockroaches (Periplaneta americana).

Methods: Recombinant Per a 7 was produced, purified, and confirmed by mass spectrometry. IgE-binding reactivity of recombinant Per a 7 was assessed by indirect ELISA using serum samples from 36 cockroach-sensitized subjects. AlgPred 2.0 analysis was used to predict IgE-binding epitopes of Per a 7. Some predicted epitope peptides were synthesized and evaluated for their IgE binding by indirect ELISA and dot blot analysis using serum from 10 cockroach-sensitized subjects. Then, competitive ELISA was performed to validate their efficacy to block IgE binding capacity to recombinant Per a 7.

Result: 61% of cockroach-allergic subjects exhibited positive IgE-binding reactions to recombinant Per a 7. Six distinctive IgE-binding epitopes of Per a 7 were predicted using AlgPred 2.0. Dot blot and indirect ELISA analysis indicated the predominant binding affinity of serum IgE from cockroach-allergic subjects toward peptides 4 and 5. The competitive ELISA confirmed that these two epitope peptides effectively inhibited IgE binding to recombinant per a 7.

Conclusion: These findings suggest that predicted peptides 4 and 5 may serve as human IgE binding epitopes of tropomyosin allergen (Per a 7) in American cockroaches. This insight holds potential implications for the development of immunotherapeutic strategies targeting cockroach allergens.
**WAC23-0310**

**Investigation of immunomodulatory effects induced during Schistosoma haematobium infection**

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**Background:** Schistosomes are one of the major human parasites, with an approximate global infection burden of 200 million individuals. Several studies have reported an inverse correlation between the prevalence of helminth infections and the occurrence of allergies. We aimed to compare the immune profile of participants with and without Schistosoma haematobium and investigate the immunomodulatory effects induced by the helminth that can cause allergy desensitization.

**Methods:** Peripheral blood transcriptional profiles of 20 S. haematobium-infected patients and 12 without active S. haematobium infection were downloaded from public database (Accession no.: GEO: GSE144206). The immune cell type abundance was compared by applying CIBERSORT deconvolution algorithm to the count matrix normalized by sequencing depth from the blood transcriptional profile. The underlying mechanistic pathway was studied using Ingenuity Pathway analysis.

**Result:** Significant differences are shown for memory B cells, naïve B cells, and activated NK cells, according to bootstrapped one-way ANOVA and subsequent Tukey with multiple test corrections. Pathway analysis results showed B cell receptor signaling, enriched crosstalk between innate and adaptive immune cells, and downregulation of IL-4 signaling. Twelve differentially expressed genes were found to be common to both the allergy pathway and the eosinophilic inflammation pathway, including FcεRII, ARG1, CCR4, CXCL1, and IL2RA.

**Conclusion:** The immune responses elicited by S. haematobium infection may induce allergy desensitization. The shared immune responses observed in both helminth infections and allergic reactions raise intriguing questions about the underlying mechanisms. Further investigation on helminth-induced immunomodulation may lead to an alternative approach to allergy immunotherapy in the future.
ALLERGY PROFILE IN A MULTI ETHNIC POPULATION AND ITS CORELATION TO SINONASAL OUTCOME TEST (SNOT-22) SCORES- A CROSS SECTIONAL STUDY.

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Background: Epidemiological studies with reference to allergy profile in mixed populations are very few, more so regarding its relationship to nasal symptom severity. This study intended to evaluate the allergy profile of a multi ethnic population

Methods: Analysis of patient data collected in a prescribed paper and google link format with regard to their allergy profile which included Eosinophil count, nasal smear for eosinophil, total serum Immunoglobulin E, Respiratory allergy test for presence of IgE antibodies to specific aeroallergens and food allergy test for presence of IgE antibodies to specific food allergens. The 22-item Sino Nasal Outcome Test (SNOT-22) is a validated chronic rhino-sinusitis health-related quality-of-life outcome (HRQoL) measure and was measured for all patients

Result: Airway allergy is a common finding in an admixed and multi-ethnic population living in an urban environment. A total of 75 cases with high total serum Immunoglobulin E and positive respiratory and/ or food allergy were evaluated in this cross sectional study. Total IgE levels correlated well with both SNOT-22 score and nasal smear findings. Respiratory allergy test correlated more with total IgE levels compared to food allergy test. The most common aeroallergens in the respiratory allergy test were Dermatophagoides pteronyssinus and Dermatophagoides farinae

Conclusion: My findings suggest a positive correlation between SNOT scores and allergy related outcomes specially total serum IgE levels and respiratory allergen test. In urbanized environment the Dermatophagoides family was the commonest aeroallergen.
WAC23-0327
Effect of dupilumab on restoration of olfactory function in patients with chronic sinusitis with nasal polyps who underwent endoscopic sinus surgery

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Background: Olfactory dysfunction is one of the most troublesome symptoms of chronic rhinosinusitis with nasal polyps (CRSwNP). There are many patients whose olfactory function does not improve even after endoscopic sinus surgery. The aim of this study was to investigate the impact of dupilumab on sense of smell in patients with CRSwNP who underwent endoscopic sinus surgery.

Methods: One hundred patients with CRSwNP and olfactory dysfunction who underwent endoscopic sinus surgery from January 1, 2020, to December 31, 2022, were enrolled. Patients were divided into a dupilumab group (n = 50 patients) treated with dupilumab 300mg subcutaneously and a control group (n = 50 patients) treated with intranasal and/or oral corticosteroids. Olfactory function was assessed using smell visual analogical scale (VAS) at every visit and Korean Version Sniffin' Sticks (KVSS) test at baseline and at week 24.

Result: Patients in the dupilumab group experienced a faster and better recovery of olfactory function compared to the control group. The degree and timing of olfactory improvements in dupilumab group were not related to prior sinonasal surgery, severity of type 2 inflammation, the volume of the polyps, comorbid asthma and/or nonsteroidal anti-inflammatory drug–exacerbated respiratory disease but related to the duration of anosmia.

Conclusion: Restoration of the sense of smell had a significant impact on satisfaction after treatment in patients with CRSwNP. Dupilumab produced rapid and sustained improvement in olfactory function, as well as alleviated the symptoms of CRSwNP.
WAC23-0346
Histaminen production by rat bone marrow derived mast cells and transcriptome

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Background: Mast cells are the unique cells to synthesize histamine that causes the symptom of itching sensation and accelerates blood circulation into tissue. Rat is the good animal model to investigate mast cell for histamine production. For the comprehension of histamine synthesis by mast cells, rat mast cells prepared with rat bone marrow cells (rBMMC) were investigated for the culture condition for histamine production comparable to the level of mature tissue mast cells. To enhance the comprehension of cellular mechanism, any changes in transcriptome were analyzed using microarray.

Methods: rBMMC were prepared by culturing rat bone marrow cells and cultured for days in the presence both of rat recombinant IL-3 (rrIL-3) and of recombinant stem cell factor (rrSCF). The cells were analyzed for histamine inclusion using cell extracts. The histamine of extracts were analyzed by labeling o-phthalehyde and read on spectrophotometer. Four samples of each condition were applied to transcriptome level using microarray.

Result: rBMMC from each weeks old rat (12 week, 16 week, 20 week, 24 week) were analyzed for histamine production level and showed different levels in the culture days depending both on the cell population (105 cells/ml and 5 x 105 cells/ml) and on cytokine levels (10 or 50 ng/ml, for each rrIL-3 and rrSCF). The maximum levels were 26.5 pg/cells that higher than mature tissue mast cells by 2. On microarray for transcriptome, several genes were changed.

Conclusion: rat bone marrow mast cells are the good model system to comprehend histamine synthesis.
WAC23-0347
Adalimumab graded challenge in woman with crohn’s disease and rheumatoid arthritis with a history of anaphylaxis to infliximab

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Background: Anti-TNF agents are the most effective therapies for Crohn’s disease and rheumatoid arthritis. Both Adalimumab and Infliximab have been proven effective in controlling disease activity. Biologics may exhibit hypersensitivity reaction. Consensus regarding this is not yet available. Drug provocation test is the diagnostic gold standard in allergy to biologics.

Case study: Our patient is a 24-year-old woman with Crohn’s disease and rheumatoid arthritis and a history of anaphylaxis to Infliximab. Adalimumab was considered a potential therapeutic solution. A graded challenge approach was proposed to mitigate the risk of hypersensitivity. The test began with skin prick test using undissolved Adalimumab solution. Continued with intradermal test of 0.02ml dissolved solution 1:1000, 1:100 and 1:10 consecutively. Skin prick test and intradermal test did not produce hypersensitivity reaction. A week after, graded challenge continued via subcutaneous route. Initial dose was administered at 5mg, and incrementally escalated until a total of 80mg dose was achieved. On the consecutive day, another 80mg was administered subcutaneously. Several minutes after, she experienced tachycardia. Tachycardia considered as adverse event of Adalimumab. It is a common cardiac adverse reaction as per se in the drug data sheet. It wasn’t considered as a hypersensitivity reaction to biologics because it doesn’t meet any of the criteria.

Conclusion: The graded challenge approach represents a valuable tool in managing patients with known hypersensitivity reactions. It enables us to mitigate the risk while ensuring necessary treatment be given. We concluded that this graded challenge was successful, however monitoring of late adverse event is necessary.
POSTER PRESENTATION

PDS5: Dec 3, 2023
(10.00-10.30)
A survey of Japanese children with atopic dermatitis in Bangkok, Thailand

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**Background:** Early and proper management of atopic dermatitis could result in clearer skin and prevent further development of another allergic phenotype. Families of Japanese children with atopic dermatitis living in Thailand had some difficulties finding information and seeking appropriate treatment. This study surveyed children’s families regarding their knowledge and accessibility to necessary medical care to assess problems impeding proper care.

**Methods:** This descriptive observational study collected data through a Google Forms online survey. The survey and informed consent were sent to parents of interest who had been treated at Samitivej Sukhumvit Hospital in Bangkok, Thailand during January 2016 – December 2021 via email or SMS.

**Result:** We received 65 responses from parents of children 0-15 years old. 33 children had 1 allergic condition and 32 children had 2-4 allergic conditions, those being atopic dermatitis (n=48), food allergy (n=28), allergic rhinitis (n=19), asthma (n=6) and other allergic conditions (n=9). 73.8% did not know finger-tip units for topical cream application and 41.7% did not know the effect of bath water temperature on atopic dermatitis flares. All respondents’ children bathed or showered at a higher temperature than the recommended 27-30°C. 71.2% had not heard about proactive use of medicine to prevent flares. 41.0 % had difficulties locating allergists, although most had no difficulty locating a hospital or finding time for appointments.

**Conclusion:** Many families do not have enough knowledge about allergic conditions. Providing accurate and useful information regarding care and treatment of atopic dermatitis and a list of nearby allergists could improve disease progression.
**WAC23-0048**  
**Neonatal epidermal hydration is associated with family history of atopy and cow’s milk consumption**

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²Ph. MD, Faculty of Medicine, University of Medicine and Pharmacy at Ho Chi Minh City, Ho Chi Minh City, Viet Nam

**Background:** Atopic dermatitis (AD) is a common skin allergic disease in children, which could be related to an immature epidermal barrier in children. We performed this study to investigate the hydration of the epidermal barrier by measuring transepidermal water loss (TEWL) and stratum corneum hydration (SCH) levels in neonates. Moreover, the association of TEWL and SCH levels with family history of atopy was also evaluated.

**Methods:** We measured SCH and TEWL levels at the cheeks of 200 healthy full-term Vietnamese neonates on the second day after birth using a GP Skin Pro ® device (Gpower, South Korea). Family history of atopic diseases was obtained from the supervisors of the neonates.

**Result:** In the study subjects, SCH levels were 14.16 ± 7.42 a.u, and TEWL levels were 6.18 ± 2.82 g/m²/h. SCH levels in neonates with exclusive breastfeed were higher compared to those with formula-feed with or without breastfeed (p = 0.03). There was a positive correlation between SCH and gestational age (r = 0.170, 95% CI: 0.032-0.302, p = 0.016). Moreover, TEWL levels were higher in neonates with family history of atopy, including paternal AD and maternal asthma, compared to those without (p = 0.026 and p = 0.033, respectively). No significant differences in SCH and TEWL levels were observed among individuals of different genders and birth methods.

**Conclusion:** Skin barrier properties in Vietnamese neonates varied according to gestational age, atopic family history, and milk consumption. Newborn skin is more sensitive and requires appropriate care.
Long-term efficacy of dupilumab for up to 5 years in an open-label extension trial of adults with moderate-to-severe atopic dermatitis

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Background: Patients with moderate-to-severe atopic dermatitis (AD) often respond inadequately to topical therapy. We assessed long-term efficacy and safety of dupilumab for up to 5 years in adults with moderate-to-severe AD.

Methods: The LIBERTY AD open-label extension study (OLE; NCT01949311) enrolled, for up to 5 years, adults with moderateto-severe AD who had participated in any dupilumab parent study. During the OLE, patients were treated with 300 mg dupilumab weekly. 226 patients transitioned to 300 mg every 2 weeks to align with approved dosage. Concomitant topical treatments were permitted. Data are presented as observed or reported for the overall study population (N = 2,677).

Result: 2,207/362/334 patients completed up to 52/172/260 weeks of treatment, respectively. Rapid improvement in mean (standard deviation) Eczema Area and Severity Index (EASI) score was observed at Week 4 (7.9 [9.2]). Mild EASI score (≤7) was achieved by Week 8 (6.0 [7.8]) and sustained until end of study (2.8 [5.6]), compared with OLE baseline (BL) and parent study baseline (PSBL) (16.5 [14.6] and 32.8 [13.2]). At Weeks 4/8/260, mean (SD) Peak Pruritus Numerical Rating Scale scores were 3.3 (2.1), 2.9 (2.0), and 2.2 (1.8), respectively, reduced from OLE BL and PSBL (5.0 [2.4] and 7.1 [1.9]). Over the 5-year OLE, treatment-emergent adverse events were reported in 85.0% of patients and led to discontinuation in 3.8% of patients.

Conclusion: Dupilumab treatment showed rapid improvement of AD signs and symptoms and sustained efficacy with up to 5 years of treatment in adults with moderate-to-severe AD. Safety data were consistent with prior studies.
SNX8 as a novel predisposing factor by an integrative study for the risk of childhood atopic dermatitis in COCOA

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Background: To discover the genetic determinants for underlying unclear mechanism of atopic dermatitis, we conducted genome-wide association study using Korean chip in Cohort for Childhood Origins of Asthma and Allergic Diseases (COCOA).

Methods: Also, to identify epigenetic biomarker, we performed in a cord blood-based DNA methylation analysis using Infinium HumanMethylation850 BeadChip (n=142).

Result: A novel variant SNX8 rs6974490 showed the association with atopic dermatitis of 1-year children (n=1,236). Children having TT genotypes had a higher risk of atopic dermatitis than those having C allele. CC genotype carriers of SNX8 rs6974490 showed decreased CpG signal in cg09164228 in SNX8 gene when compared to CT or TT carriers. Furthermore, the interaction between childhood SNX8 genotype and their mother’s specific IgE to Dermatophagoides farina during pregnancy influenced the risk of AD and the effect of eosinophil levels on SNX8 polymorphism in children. A SNX8 variant was significantly associated with childhood atopic dermatitis, blood eosinophil, and maternal IgE level following house dust mice exposure during pregnancy.

Conclusion: An integrative multi-target analysis might reveal new functional implications related to epigenetic control according to genotype in atopic dermatitis.
WAC23-0119
Epidemiology of atopic dermatitis in the Allergy service of a third level medical center.

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Background: Introduction. Atopic dermatitis an important cause of allergic disease among paediatric population, the allergy service was created in July 2005 to attend properly this group of patients in the general consultation of a third level medical centre. Objective. The purpose of this study is to report the cases of atopic dermatitis diagnosed from July 2005 to December 2022.

Methods: Methods. This is a descriptive, retrospective, transversal study between the period mentioned above. Selected medical records of patients, some of them supplied by Dermatology service, apply for diagnostic criteria according to the guidelines on atopic dermatitis for Mexico and the atopic dermatitis clinical guideline of the American Academy of Dermatology used to make diagnosis of atopic dermatitis. Patients were classified by age and sex

Result: Results. 5845 medical records of patients were registered between period mentioned above. 475 patients completed criteria for diagnosis of atopic dermatitis. Distribution of patients by age and sex showed that 200 (42.1%) patients were male, 275 (57.8%) patients were female. 285 (60%) patients were found to be in the range of 0-9 years. The majority of atopic dermatitis patients were males in the range of 0-4 years with 89 (18.7%) patients.

Conclusion: The importance of atopic dermatitis diagnosis and treatment requires a multidisciplinary management that must consider the individual clinical variability of the disease. The results of this study improve specialized medical attention in paediatric patients with atopic dermatitis.
WAC23-0207
Are breast milk oligosaccharides associated with eczema risk in Chinese infants?

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Background: Human milk oligosaccharides (HMOs) in breast milk (BM) modulate immune responses in the offspring and alter the risks of allergy development. Nonetheless, data on breast milk (BM) HMO composition is limited in Chinese. This study characterized BM HMO levels of Chinese mothers and investigated their associations with eczema occurrence.

Methods: SMART Gen is a mother-child cohort that recruited healthy Chinese pregnant women regardless of familial allergy history. BM samples were collected at 1-month postnatal. The concentrations of HMOs including 2′fucosyllactose (2′-FL), lacto-N-neotetraose (LNnT), 3′-sialyllactose (3′-SL) and 6′-sialyllactose (6′-SL) were measured by liquid chromatography-mass spectrometry. Allergy development in infants was assessed at 6 and 12 month.

Result: Among 104 mother-child pairs, 30 (41%) subjects had physician-diagnosed eczema at 6 months, while 23 (27%) of 84 children had eczema at 12 months. A total of 80 BM samples were analyzed. The median 2′-FL, LNnT, 3′-SL and 6′-SL concentrations in nmol/ml were 1447, 755, 22.1 and 24.7 respectively. 2′-FL, 3′-SL and 6′-SL were much lower than those reported in Australians (JACI 2021). Among exclusively breastfed infants at 1 month, 6′-SL concentrations were lower in those with eczema at 6 months (19.1 vs 29.7, P = 0.047). 2′-FL concentrations were higher in 1-month BM consumed by infants with food allergy at 12 months (P = 0.036).

Conclusion: This Chinese mother-child cohort shows that eczema commonly affects Chinese babies while onequarter of them resolved by one year of age. Our results suggest 6′-SL to be protective against eczema development at 1 month among exclusively breastfed infants. (funded by Health and Medical Research Fund [reference 06170466], Health Bureau, Hong Kong SAR Government)
WAC23-0208
Is it type III hereditary angioedema or something else

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Background: Hereditary angioedema (HAE) is a disease caused by either a lack of C1-inhibitor protein or dysfunctional C1inhibitor protein. HAE manifests with symptoms related to angioedema of the upper airway, skin, and/or gastrointestinal tract.

Case study: M is a 37 years old Female. She noticed 4 years ago that she get lip swelling, associated with cracks lips, redness and irritation on the area around the lips, sometimes itching. This occur every month, a week before the menstrual period. Prior to the 4 years she only had eczema on the hand nothing on the face. Before she come to our allergy clinic few month ago she saw several physician were they prescribed either locoid or elidel with a temporary improvement only, antihistmaine does not help her symptoms at all. She had no tongue swelling nor throat swelling, she had no abdominal pain. She is other wise healthy. Family History: Sister had developed atopic dermatitis a year ago and recently her eczema flare before her periods. No history of consanguinity Investigation:C1 Esterase inhibitor 0.383 G/L(0.150-0.350)= 38.3 mg/dl (15-35). N C1 Esterase inhibitor function > 100 (>68) N C 4 27.8 (15-57) N. ESR 9 (0-20) N She was started on topical steroids to be applied a week before her periods. She continued to be symptomatic.

Conclusion: Could this case be HAE with normal C1 Esterase, Type III? She will need genetics work up to confirm. Could be a new entity related to atopic dermatitis associated with hormonal changes?
Urinary Mono-n-butyl phthalate is associated with childhood atopic dermatitis via interleukin5: ECHO-COCOA study

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Background: Several studies have reported an association between phthalate exposure and an increased risk of atopic dermatitis (AD). However, there is little mechanistic information regarding the connection between phthalate exposure and AD development in children. In this study, we investigated the effect of Mono-n-butyl phthalate (MnBP), one of the phthalate, on AD development and explored the potential mechanisms.

Methods: Urinary concentrations of phthalate metabolites were measured in 221 children aged 7 years from the Cohort for Childhood of Asthma and Allergic Diseases (COCOA) study. Diagnosis of AD was conducted by pediatric allergists. The serum total IgE and the serum cytokine levels were analyzed.

Result: MnBP level was higher in children with AD compared to that of controls (P=0.006). Higher MnBP level was increased the risk of AD compared to controls (aOR=2.245, 95% CI 1.116-4.515). MnBP level is correlated with IL-5 (r=0.201) and eosinophils (r=0.202). IL-5 was positively correlated with total IgE level (r=0.252) and eosinophils (r=0.517). The mediation analysis result indicates that IL-5 had a significant positively mediating effect on the association between MnBP and eosinophils.

Conclusion: Exposure to MnBP affect the childhood AD via serum IL-5 mediated eosinophilic inflammation.
Food Sensitization and IgE-Mediated Food Allergy among Young Children with Atopic Dermatitis at an Urban Tertiary Care Center

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Background: Prevalence of food sensitization and IgE-mediated food allergy in young children with atopic dermatitis (AD) may vary according to region and socioeconomic status.

Methods: A cross-sectional study was performed in 90 children, aged 5 years and younger, who visited the pediatric allergy clinic at King Chulalongkorn Memorial Hospital and had skin prick test and/or specific IgE for food performed. The medical records were reviewed and the questionnaires were used.

Result: A total of 90 children were enrolled, with a median age of 38 (IQR 18 – 58) months. The median age at diagnosis of AD was 4 (IQR 3 – 7) months and the median age at detection of food sensitization was 7 (IQR 4 – 12) months. The prevalence of food sensitization was 72.2%. The three most common food allergens were egg white (55.6%), egg yolk (50%) and wheat (38.9%). Sixteen percent of children with AD had IgE-mediated reaction after food ingestion. Delivery method, time of solid food introduction, duration of exclusive breastfeeding, maternal diet during pregnancy and breastfeeding, history of antibiotics, bath soap use and moisturizer use were not significantly associated with food sensitization. There was significant association between cesarean section and IgE-mediated food reaction (OR 3.19, P = 0.046)

Conclusion: Food sensitization was observed in nearly 75% of children with AD, and 16% developed IgE-mediated food reaction. Cesarean section had significant correlation with IgE-mediated food reactions.
**WAC23-0272**

**Prenatal Maternal Gut Microbiota and Short Chain Fatty Acid Profiles in relation to Atopic Dermatitis in Offspring**

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**Background:** The early colonisation of gut microbiota is shown to play a significant role in influencing the risk of developing infant atopic dermatitis (AD). This study aims to evaluate prenatal maternal gut microbiota and short chain fatty acid (SCFA) profiles during pregnancy in relation to early onset atopic dermatitis in their offspring.

**Methods:** From the Singapore Preconception Study of Long-Term Maternal and Child Outcomes (SPRESTO) birth cohort, a sub-cohort of 97 mother-infant pairs were selected and grouped as follows: (1) non-AD mother with non-AD infant (controls), n=33; (2) non-AD mother with AD infant, n=24; (3) AD mother with AD infant, n=40. Stool microbiota and short chain fatty acid (SCFA) signatures at 12-13 weeks and 34-36 weeks pregnancy were analyzed by using 16S rRNA sequencing and liquid chromatography-mass spectrometry (LC-MS) respectively. Mann Whitney analysis were carried out.
**Result:** Healthy controls showed a distinct prenatal maternal stool microbiota and SCFA signatures with higher propionic acid, isobutyric acid and valeric acid, and enriched with SCFA producing bacteria such as Faecalibacterium, Eubacterium, and Bacteroides. Whereas the prenatal maternal stool microbiota of AD groups were enriched with Blautia, Ruminococcus, Streptococcus, Tyzzerella and Veillonella regardless of non-AD mother or AD mother. These microbiota perturbations during pregnancy were more apparent in AD mother with AD infant group.

**Conclusion:** Perturbation in the maternal stool microbiota and SCFA profile during pregnancy are associated with the development of AD in infants.
THE PROPORTION OF ATOPIC DERMATITIS IN NEONATES AFTER PHOTOTHERAPY WITHIN TWO YEARS: A CASE STUDY IN A TERTIARY REFERAL HOSPITAL

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Background: Phototherapy had already known to cause several side effects. The increasing prevalence of allergic diseases globally has made a lot of researches focused on the effects of environmental stimulus on the early development of the immune systems. Several studies have shown evidence that phototherapy is associated with a higher risk of atopic dermatitis (AD).

Methods: This study is a cross-sectional case study of previous study “The Impact of Phototherapy on Eosinophil Count in Neonates”. Of 58 subjects were observed within 2 years after getting done the phototherapy. The proportion of AD was determined using Parental Questionnaire including 1) Does your child had a red rash/eczema which can come and go?; 2) If Yes, has this caused itching or scratching?; 3) Has this red rash/eczema affected any of the following areas (during the last week): Around the eyes, ears, scalp, cheeks, forehead, neck, trunk, folds of the elbows/behind the knees, wrist or ankle, outer arms/legs?. “Yes” answer in each question to be classified as AD.

Result: Total of 58 subjects were collected from September 2020 to May 2021, consist of 37 males (63.8%). There were 2 subjects had developed AD (0.03%).

Conclusion: We found low proportion of developing AD after neonatal phototherapy within 2 years.
Real-World Experience on Efficacy and Safety of Upadacitinib in Patients with Atopic Dermatitis in Korea

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Background: Upadacitinib is an oral selective Janus kinase (JAK) 1 inhibitor that has demonstrated high efficacy and a favorable safety profile in clinical trials for atopic dermatitis (AD) patients. However, clinical trial settings may not always reflect real-world practice. This study aimed to assess real-world data on the efficacy and safety of upadacitinib treatment for AD patients.

Methods: 110 AD patients treated with upadacitinib were analyzed retrospectively by medical records at the National Medical Center between October 2021 and December 2022. Patients who received upadacitinib treatment for at least 16 weeks were included. In moderate-to-severe AD group, efficacy was assessed based on the achievement of Eczema Area and Severity Index at weeks 2 and 16 compared to baseline, whereas mild AD group was assessed by the reduction of patient-reported outcomes. Safety was evaluated throughout the study period.

Result: The mean EASI score significantly decreased after 16 weeks of upadacitinib treatment. At week 2, 67%, 35%, and 6% of moderate-to-severe AD patients achieved EASI 50, EASI 75 and EASI 90 respectively. At week 16, 88%, 71%, and 31% of moderate-to-severe AD patients achieved EASI 50, EASI 75 and EASI 90 respectively. The mean average reduction of itch Numeric Rating Scale in mild AD patients was 3 points. The most common adverse event was acne in 42 patients (38%), followed by herpes simplex infection in 14 patients (13%). No significant adverse events occurred.

Conclusion: Upadacitinib was effective and safe for AD patients in a real-world clinical setting.
Atopic & Inflammatory Skin Conditions Amongst People Experiencing Homelessness: Insights from Miami Street Medicine

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Background: Urbanization has been associated with increased prevalence of inflammatory skin diseases due to increasing environmental irritants and air pollution. People experiencing homelessness (PEH) are disproportionately impacted by this trend due to exposure to irritants, allergens, and limited access to appropriate hygiene resources. While recent studies have reported higher rates of cutaneous infections in PEH compared to the general population, there is limited data on the prevalence of inflammatory skin disease. To identify allergen and irritant exposure on skin disease in PEH, we performed a chart review of 193 patients seen through the university’s weekly street-based medical teams.

Methods: A chart review was conducted of patients reporting dermatological complaints seen by Miami Street Medicine team. Information regarding dermatological diagnoses were documented by members of the study team on a HIPAA compliant database. Patients were given information regarding the review and provided oral consent to participate in the study. MSM brings healthcare directly to the unsheltered population. Patients receive health screening, medication management, wound care, chronic disease management, education/counseling, and longitudinal care coordination with routine follow-up visits.

Result: Over a 12-month period, 193 individuals reported cutaneous symptoms. Most common dermatological diagnoses include infectious conditions (n=51, 26.4%), inflammatory diseases (n=44, 22.8%), miscellaneous/unspecified (n=32, 16.6%), ulcerations/erosions/wounds (n=26, 13.5%), cutaneous neoplasm/UV damage (n=19, 9.8%), pruritus (n=13, 6.7%), and nail disorders (n=8, 4.2%).

Conclusion: Our research describes preliminary findings regarding prevalence of cutaneous disease in PEH. Many diagnoses in this cohort were inflammatory, including contact dermatitis. Interventions and management strategies for PEH are needed to combat possible health disparities.
A case series of Steven-Johnson’s syndrome in children: same clinical profile with different aetiology

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Background: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are severe cutaneous adverse reactions (SCAR) with high mortality rates in children. SJS/TEN in children presents several challenges to practitioners, especially in terms of aetiology such as drugs and infections which cause differences in therapy so that it also affects patient outcomes, because this sometimes causes delays for practitioners in taking the earliest possible steps quickly and precisely. The purpose of this paper is to report several cases with different aetiology and management in children with SJS/TEN.

Case study: There were 7 cases of SJS/TEN. 4 cases of infection due to Enterobacter Cloacae, Mycoplasma Pneumoniae, Salmonella Typhi, and Staphylococcus Coagulase Negative, and were given antibiotics: amikacin, azithromycin, ceftriaxone, and cefotaxime. Three cases due to anti-epileptic drugs (AED), consisting of 2 cases with intractable epilepsy, one received lamotrigine, valproic acid and phenytoin; and the other one received carbamazepine, valproic acid and phenytoin; and 1 case with epilepsy received phenytoin, then the AED regimen was replaced with levetiracetam and/or clobazam. Supportive therapy was given in all cases.

Conclusion: It is important to determine the aetiology of SJS/TEN even if there is no difference in symptom profile, because it has implications for therapeutic management.
GLOBAL SURVEY ON MANAGEMENT OF PEDIATRIC ATOPIC DERMATITIS

Background: Management and adoption of novel therapeutic approaches in pediatric atopic dermatitis (AD) remain a challenge. We aimed to survey the perspectives and practice strategies among physicians worldwide.

Methods: A web-based questionnaire was created by the World Allergy Organization (WAO) Junior Member Steering Committee Group and distributed to all WAO members from May to November 2022. The study was approved by the WAO Ethics Committee.

Result: There were 530 respondents, of which 496 responses from 81 countries were included for analysis. AD patients were mostly cared for by physicians specialized in allergy–immunology (67.14%), pediatrics (12.70%), and dermatology (10.69%). Over half (56.25%) of the participants diagnosed AD solely based on clinical symptoms and laboratory tests, while 40.5% followed a guideline. Most participants (93.08%) agreed
that avoiding triggering factors was crucial for treatment. Various means of treatment were mentioned, like topical corticosteroids (95.60%), moisturizers & baths (95.17%), topical calcineurin inhibitors (87.84%), and biologics (72.96%). In low or lower-middle countries, approaches such as phosphodiesterase-4, JAK inhibitors, and biologics were limited due to cost/access. Barriers for AD management included: patients’ adherence to treatment, disease severity, cost & access, corticosteroid phobia, finding out triggers, treatment side effects, and lack of the appropriate medications for children. Patient dissatisfaction was associated with lack of access to biologic therapy (P=0.032) and treatment side effects (P=0.022)

**Conclusion:** Guidelines have limited application in clinical practice. Disparities regarding diagnosis and treatment of AD from physicians’ perspectives exist, nevertheless main treatment options are widespread and consistent. Inaccessibility to biologics and treatment side effects affected patients’ satisfaction
WAC23-0312
Food Avoidant Eating Behavior of Chinese Toddlers with Eczema: Findings from a Birth Cohort in Hong Kong

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Background: Problematic eating behavior in young children appears at two extremes, from picky eating to overeating, may result in faltering growth to childhood obesity. Their relationship with early-onset eczema remains unclear. This study investigated the eating behaviors among young Hong Kong children with eczema.

Methods: The microbiome-based MOMmy birth cohort recruited pregnant women regardless of family history of allergy, and their babies were prospectively followed for growth and allergic outcomes. Eating problems in these children were assessed at 2-year-old visit by a newly developed Eating Problems in Children Questionnaire (EPICQ) which includes the Chinese translated Children Eating Behavior Questionnaire (CEBQ). The relationship between physician-diagnosed eczema and anthropometry were analyzed by Spearman Correlation whereas the relationship between physician-diagnosed eczema and various eating problems were analyzed by Mann-Whitney U test.

Result: 204 children in this cohort were included, and 27% of them had eczema ever. Eczematous children had significantly higher Satiety Responsiveness (SR) and Slowness in Eating (SE) scores than those without eczema (P=.007 and .044 respectively). SE score also showed weak inverse correlations with weight-for-height z score, suggesting longer mealtime to be associated with a lower weight-for-height z score (r=-.143, P=.041). Eczema was not associated with other behavioral domains in CEBQ.

Conclusion: Satiety Responsiveness and Slowness in Eating are both considered to be food avoidant behaviors, which are more common among Chinese toddlers with eczema. Longer mealtime in our children are also associated with lower body weight. (funded by InnoHK of Hong Kong SAR Government)
**WAC23-0313**  
Allergy in Children’s Population.

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**Background:** Goal of our work included study of prevalence of allergic diseases and risk factors in the children’s populations of Georgia (2022-2023).

**Methods:** Studied group included 899 children from 1- to 14 (girls – 51.8%; boys – 48.2%). At the first stage of epidemiological study the large-scale work was performed, including screening of 1899 children through questionnaire. On the second stage of epidemiological studies part of the patients with allergic diseases (315 children) were subjected to allergological study.

**Result:** Number of girls exceeded the one of boys (p<0.001), especially within the age group from 7 to 14 years, Symptoms of allergic rhinitis (rhinorrhea, sneezing, nose itch, nasal obstruction and eyes’ itch) were identified in 16.7 of population (p<0.05); symptoms of bronchial asthma (wheezing (9%), coughing episodes at night (5.7%), intolerance to physical load (3.9%), indoor and outdoor episodes (11.2%), episodes of coughing and rates in response to stimulus (7.2%)) were identified in 9.8% of the population; atopic dermatitis (dermatitis, itch, revelation in early age, involvement of large areas in early age, damage of extremities bending and stretching surfaces in adults) – 4.9% (p<0.01); food allergy – 9.7% (p<0.001) etc. At the second stage, on the basis of prick-testing, average IgE, in our case, was 1-4 times greater than normal level. Results of study of allergens showed sensibilization to domestic dust (D.F. and D.P.) (75, 04%) (p<0.05). In 24.96% of cases there was stated sensibilization conditioned by cat and dog epidermal allergens.

**Conclusion:** In development of allergic diseases share of risk-factors is quite high.
Compliance is an important factor in the effectiveness of atopic dermatitis treatment

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Background: Education of patients with atopic dermatitis and their families is key to successful treatment. Identifying and analyzing the factors influencing the effectiveness of treatment of patients with atopic dermatitis (AD) was done from our clinic in Kyiv, Ukraine

Conclusion: A clear and accessible explanation to the patient and their relatives on the action of emollients on the skin in AD patients is critical to increase compliance between the doctor and the patient and to ensure the conscientious implementation of recommendations and the achievement of the expected clinical outcomes.
Successful use of combination therapy of omalizumab with cyclosporine in the treatment of refractory autoimmune chronic urticaria: a case report

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Background: Autoimmune chronic urticaria (aiCU) presents high disease activity and refractory response to antihistamine treatment, affecting quality of life. Two endotypes of autoantibodies associated with the activation of cutaneous mast cells have been defined. Objective: to present a case of aiCU refractory to usual treatment and successful use of omalizumab and cyclosporine.

Case study: A 17-year-old female diagnosed with DM1, vitiligo, and Hashimoto's thyroiditis. She started at age 13 with intermittent episodes of urticaria for three years with partial response to antihistamines, as well as steroids in exacerbations. Due to a high load of autoimmunity, biomarkers with a positive report are requested. Treatment begins with omalizumab 300 mg/month for 3 months without improvement; Cyclosporine A (3 mg/kg/day) was added with a partial response after the second month of combined treatment, achieving control after six months and allowing a gradual decline.

Conclusion: Omalizumab is indicated for refractory aiCU, however, approximately 30% of patients remain symptomatic with high doses of omalizumab. In our patient, due to limited availability of omalizumab, the maximum dose is not indicated and it was decided to add a 3rd line of treatment with an adequate response. Combined therapy of omalizumab with cyclosporine can be considered a therapeutic alternative for aiCU refractory to conventional therapies, it is necessary to work on the standardization of management guidelines for this type of therapy, as well as to comprehensively evaluate refractory cases of chronic urticaria with the in order to identify potential therapeutic opportunities and contribute to improving the quality of life of patients.
WAC23-0057
C1-esterase inhibitor (human) for the treatment or prevention of angioedema attacks in patients with hereditary angioedema in routine clinical practice

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Background: The ongoing Icatibant Outcome Survey (IOS) registry (NCT01034969) includes patients receiving plasmaderived, nanofiltered C1-esterase inhibitor (human) (C1-INH, Cinryze) from 19 January 2017. Safety and effectiveness of C1INH as acute treatment or prophylaxis were assessed.

Methods: Patients had a diagnosis of hereditary angioedema (HAE) with C1-esterase inhibitor deficiency/dysfunction (HAE-1/2) or other diagnosis and received ≥1 dose of C1-INH. Primary endpoints included adverse events (AEs) and C1-INH exposure. Effectiveness endpoints were secondary.

Result: At the 11 January 2023 data cut-off, 240 patients (female, 68.8%; HAE-1/2, 89.8%; median age, 40.4 years) had received C1-INH. Overall, 114 (47.5%) patients experienced AEs (375 events); 3 AEs (abdominal pain upper, paraesthesia, rash maculopapular) were probably C1-INH-related. Sixty-three (26.3%) patients experienced serious AEs (150 events); none were C1-INH-related. Overall, 2383 C1-INH injections were administered to 101 patients as primary treatment for 2348 attacks. Median time to complete resolution and duration of attack was 8.75 and 11.0 hours, respectively. Median number of C1-INH injections required per attack was 1. Median time to complete resolution of laryngeal and severe attacks was 6.00 and 12.92 hours, respectively. Of 2037 attacks, 95.8% were treated with self-administered C1-INH. Median duration of attack for self-administered vs HCP-administered C1-INH was 11.00 vs 18.21 hours, respectively. Mean time between attack onset and first injection for self-administration and HCP-administration was 2.09 vs 3.11 hours, respectively.

Conclusion: Interim long-term IOS data (≤6 years’ exposure) are consistent with the known safety and effectiveness of C1INH, and further support its use in HAE.
WAC23-0079
Efficacy of Omalizumab for the treatment of Chronic Urticaria in the Vietnamese population

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Background: Omalizumab is an anti-IgE monoclonal antibody used in patients with urticaria unresponsive to conventional therapies. Objective: The study aimed to evaluate the role of omalizumab in patients with chronic urticaria.

Methods: An intervention study with 62 patients divided into two groups: a study group (n=31) and a control group (n=31). The patients in the study group received omalizumab 300mg subcutaneously every 4 weeks for 3 consecutive sessions. They were followed up for 8 weeks after treatment with omalizumab to assess the efficacy based on the standardized criteria such as urticaria activity score, urticaria symptoms, and disease severity. Adverse events during drug administration were also evaluated.

Result: The study group and the control group had similar disease characteristics. The results showed that 80.6% of urticaria patients were ≤ 50 years old and 67.8% of study patients were female. There were 62.6% of patients with severe urticaria. The study group had better improvement in UAS than the control group, although the difference was not statistically significant. Regarding the frequency of urticaria, the improvement was statistically significant between the control and the study groups (p<0.001). There was 1 (3.2%) patient in the study group who had pain at the injection site, 1 (3.2%) had a stomachache and 1 (3.2%) had a headache. In the control group, there were 2 (6.4%) patients had a headache, fever, and sore throat. However, these symptoms co-occurred with a pre-existing illness.

Conclusion: Omalizumab is an effective and safe anti-IgE monoclonal antibody in treating chronic urticaria.
WAC23-0085
Toxocariasis Seroprevalence in Chronic Urticaria Patients

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Background: Chronic spontaneous urticaria (CSU) be associated with helminth infection, including Toxocariasis. The role of Toxocara canis (T.canis) in pathogenesis of CSU was unclear. We aimed to investigate the seroprevalence of T.canis infection in CSU patients in Viet Nam.

Methods: A cross – sectional study was conducted in 107 patients with CSU. Their blood samples were collected to examine eosinophil counts, total IgE level and IgG antibody response to against T.canis. Demography and personal habits of the study subjects, as well as clinical characteristics of CSU, were obtained by using a questionnaire.

Result: The mean age of the study subjects was 36,74 ± 11,39 years. We found that 23,4% (25 of 107) CSU patients had positive IgG response to against T.canis. The duration of CSU patients with T.canis IgG (+) was significantly shorter than that in those with T.canis IgG (-) (10,72 ± 12,8 months vs. 12,67 ± 19,57 months). Urticaria activity score was higher in T.canis IgG (+) than that in those with T.canis IgG (-) (2,6 ± 0,5 vs. 2,4 ± 0,7). CSU patients had elevated total IgE level and increased blood eosinophil counts were 44,9% (48 of 107) and 19,6% (21 of 107).

Conclusion: The data revealed a slightly high rate of T.canis infection in CSU patients. The study performed that no association between T.canis infection and total IgE level or increasing blood eosinophil counts. We believe that further researches will be useful to indicate clearly the causality of T.canis and CSU.
Efficacy of treatment in alleviating severe cutaneous pruritus in elderly patients

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Background: Cutaneous pruritus is a distressing symptom that significantly impacts the quality of life (QoL) of affected individuals, particularly in the elderly population. This study aimed to assess the benefit of a specific treatment regimen in alleviating intense cutaneous pruritus (ICP) in elderly patients.

Methods: A prospective observational study involving elderly patients with ICP was conducted over a period of six months. Following initial assessment, a tailored treatment approach was administered to each patient, which included a combination of topical agents and systemic medications. Demographic and clinical variables were described. Additionally, efficacy and safety outcomes for ICP treatment were collected at 0-2-6 months of treatment: Dermatology Life Quality Index (DLQI), Hospital Anxiety and Depression Scale (HADS), pruritus and insomnia Visual Analog Scale (VAS) and Itch Severity Scale (ISS).

Result: Ten patients were recruited with a mean age of 76 years (range 65-89 years). After 6 months of the implementation of the specific treatment regimen [topical emollients/moisturizers plus topical corticoesteroïds/calcineurin inhibitors (if eczema/dermatitis) and systemic antihistamines], a marked improvement was observed in eight patients (80%), with statistically significant improvements observed in DLQI, HADS, itch and insomnia VAS and ISS, being well-tolerated in all patients.

Conclusion: This study underscores the effectiveness of the employed treatment regimen in reducing ICP in elderly patients. The absence of significant adverse effects further supports the safety and tolerability of the approach. Effective management of ICP in the elderly population can greatly enhance their QoL and overall well-being, underscoring the importance of continued research in this area.
Patch test reactions in diagnosis of allergic contact dermatitis in Kyiv, Ukraine

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Background: Allergic contact dermatitis (ACD) patients differ from non-ACD patients in immunologic responses, lacking βdefensins, being more likely to react to protein allergens, and may be less likely sensitized to non-protein allergens, with patch-test responses to commercially available patch test series differing in ACD patients. This study analyzes the pattern of positive patch test results for the most common contact allergens in patients with ACD and age-matched non-allergic contact dermatitis individuals.

Methods: 36 patients with uncontrolled persistent asthma were assessed, aged (37±5.1) years. Patients were monitored for acid-base status initially and 12 days after treatment and divided into 2 groups; Group 1 received standard therapy for asthma; Group 2 received standard therapy and 4.2% sodium bicarbonate.

Result: Among the 70 subjects, 64% gave a personal or family history of an atopic disorder. Frequencies of single, double or polyvalent sensitizations were nearly identical between the groups. Analysis of the anatomical sites of dermatitis showed differences between the allergic and non-allergic dermatitis groups: in ACD patients, the face (7.2%) and hand dermatitis (6.6%) were more common, and leg dermatitis (4.0%) was less common.

Conclusion: A high frequency of positive reactions to patch tests was found in the ACD subjects, implementation of patch test being extremely important for the assessment of allergic versus non-allergic contact dermatitis.
COVID-19 and COVID-19 Vaccinations in Chronic Spontaneous Urticaria and Hereditary Angioedema Patients; Single Center Experience

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Background: COVID-19 vaccinations trigger HAE attacks and increase the severity of attacks. There are also reports about CSU caused and HAE attacks triggered by COVID-19 vaccines. We investigated the effects of COVID-19 and its vaccination on our CSU and HAE patients.

Methods: The files of sixteen patients who received omalizumab treatment with the diagnosis of CSU were reviewed retrospectively. Also, 10 patients who followed up with the diagnosis of HAE were included in the study.

Result: In 2 patients, CSU was triggered by BioNTech vaccine; 2 patients having CSU were exacerbated. During the COVID-19 disease, our 3 patients (Type-1 HAE) had no attack and 2 patients (Type-2 HAE) had an attack. No postvaccination attacks were observed.

Conclusion: In patients with CSU and HAE, allergists should be aware that COVID-19 and vaccinations may trigger these diseases.
WAC23-0139

Health-related quality of life in adults with hereditary angioedema: Results from a multinational survey

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Background: Patients with hereditary angioedema (HAE) experience recurrent, painful, and occasionally life-threatening swelling attacks. The objective was to develop an understanding of the humanistic burden of HAE.

Methods: We conducted a non-interventional, cross-sectional, web-based survey of adult patients with a self-reported diagnosis of HAE from 13 countries (Argentina, Brazil, Colombia, Croatia, Denmark, Germany, Hungary, Ireland, Norway, Poland, Portugal, Romania, and Sweden). Patient-reported outcomes included Angioedema Quality of Life (AE-QoL; higher score indicates greater impairment) and Angioedema Control Test (AECT; total score <10 indicates poorly controlled disease).

Result: Overall, 260 patients with HAE (age range: 18-81 years; 27.3% male; 89.6% HAE type I/II), completed the survey; 58.8% were using long term prophylaxis (LTP), of which, 36.6% were using androgens. The mean±SD age at first symptoms was 12.0±8.9 years, while diagnosis occurred at 24.2±13.6 years. Patients reported a mean±SD of 21.8±27.2 attacks in the past 12 months. Recalling their most recent attack, the majority (68.5%) of patients reported it occurred within the last 4 weeks; 56.8% reported it lasted between 6 hours and 2 days, and 36.2% reported the attack occurred above the neck. Mean±SD AE-QoL total score was 42.9±23.2; with domain scores of 35.4±27.3 for Functioning and 50.4±28.3 for Fears/shame. Mean±SD AECT score was 7.4±3.1, indicating poor disease control, and 75.0% reported an AECT total score <10.

Conclusion: The burden of HAE was high despite most patients being on LTP. Patients reported uncontrolled disease and significant impairment in health-related quality of life.
WAC23-0141
Support for STAR-0215 Administered Every Three- or Six-Months for Hereditary Angioedema: Phase 1a Results

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Background: STAR-0215 is an investigational extended half-life monoclonal antibody for hereditary angioedema (HAE). This trial (NCT05477160) assesses STAR-0215's potential for safe and durable suppression of HAE attacks (≥3 months) after single doses in healthy subjects.

Methods: This is a randomized, blinded, placebo-controlled, single ascending dose trial evaluating safety, tolerability, pharmacokinetics (PK), pharmacodynamics (PD), and immunogenicity of STAR-0215 after 100, 300, 600, and 1200 mg subcutaneously (SC) and 600 mg intravenously (IV) or matched placebo (3:1 randomization) in cohorts of healthy adult subjects for up to 224 days. PD is assessed by changes in cleaved high-molecular-weight-kininogen (cHMWK). This report includes complete results from the 100, 300 and 600 mg SC cohorts and initial results for the 1200 mg SC and 600 mg IV cohorts.

Result: 41 subjects received STAR-0215 (n=31) or placebo (n=10). Mild, related treatment emergent adverse events were seen in 11 subjects, most commonly injection site reactions (n=9). STAR-0215 demonstrated dose-dependent concentrations, rapid absorption, slow clearance, and median t1/2 of 87-109 days. At Day 84, median concentrations remained 1x, 3x, and 6x above 12 mcg/mL (potential efficacy threshold) after 300, 600, and 1200 mg SC, respectively. Suppression of cHMWK formation consistent with plasma kallikrein inhibition was achieved. PK modeling confirmed a range of doses administered every 3- or 6-months may be effective in HAE attack prevention.

Conclusion: With favorable safety profile, long half-life, and durable PD, STAR-0215 demonstrates early proof of concept in healthy subjects as a potential HAE therapy with robust attack suppression and low treatment burden.
Potential Biomarkers to Predict Antihistaminic and Omalizumab Treatment Response in Chronic Spontaneous Urticaria: Ig E, Tryptase, Eosinophilic Cationic Protein and D-Dimer

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Background: Potential biomarkers to predict omalizumab or antihistamine treatment response in chronic urticaria (CSU) are not fully defined.

Methods: In our retrospective cross-sectional study, data of patients who had used omalizumab or antihistamine treatment for at least 12 weeks in allergy clinic due to CSU between 2015-2021 were reviewed. Patients whose urticaria could not be controlled despite standard single-dose second generation antihistamine sg AH were included in the study, while patients with missing data, isolated inducible (physical) urticaria were excluded. The patients who received 2-4 antihistamine treatments (n:421) and those who received omalizumab treatment (n: 88) were divided into 2 groups. Urticaria control test (UCT:0-16) was used to evaluate the treatment response. UCT was defined as ≥12 (Responder), UCT< 12 (Non responder).

Result: It was determined that the patients in the omalizumab group were older, had a longer disease duration and had worse urticaria control. Baseline ECP, disease duration and crp correlated with disease severity. Baseline ECP was found to be inversely correlated with UCT (p<0.001 r:0.268). Responder rates were similar in the antihistamine and omalizumab groups (58.20% vs 58.00%, respectively; p>0.999). ECP and D-dimer levels of non responder patients in the antihistamine group were significantly higher than in responder patients (ECP:49 ng/ml vs 28.1 p: < 0.001) (D-dimer: 0.60 vs 0.3 mg/L p: < 0.001), while there was no difference in the omalizumab group. Not only significant improvement was observed in UCT after both treatments, but also there was a decrease in tryptase and D-dimer levels.

Conclusion: D-dimer and tryptase can be determined to assess the change after treatment.
WAC23-0263
The first Vietnamese case report of HAE-1 with a deletion mutation of exon 1 in the SERPING 1 gene.

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**Background:** Hereditary angioedema (HAE) is a rare autosomal dominant disease caused by the lack of or a dysfunctional C1-inhibitor protein. HAE characterise with recurrent episodes of angioedema and potentially life-threatening with upper airway obstruction. Therefore, early diagnosis and effective long-term prophylaxis therapy are necessary. Type I HAE (HAE-1) is due to a deficiency in C1 inhibitor, accounting for the majority of 85% while Type II HAE with dysfunctional C1-inhibitor and HAE with normal C1-inhibitor account for the rest of 15%. Diagnosis of HAE-1 is based on clinical manifestation, blood testing with low C1-INH level and confirmed by genetic testing with mutation in SERPING 1.

**Case presentation:** A 41-year-old female patient presented with a history of recurrent swelling of the face and hands. The first episode onset when she was 24 years old. No family history has been noticed. Her blood test showed low level of C4 (2.40 mg/dL) and C1-INH (4.4 mg/dL). Genetic testing with whole exome sequencing was employed and a large exon 1 deletion mutation of SERPING1 was detected. The patient was finally diagnosed with HAE-1. She was successfully treated with fresh frozen plasma during the exacerbation and long-term prophylaxis with danazole. Her daughter who has never had clinical manifestation was also screened for HAE. A low level of C1-INH (7.0 mg/dL) and a similar deletion mutation of SERPING 1 was found.

**Conclusion:** A positive family history may not be presented in all patients of HAE and early screening for children of parents with HAE-1 is required.
WAC23-0127
Anaphylaxis outcomes in open food challenges conducted in a paediatric tertiary centre in Singapore

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Background: Oral food challenges (OFC) are used clinically to diagnose food allergies, especially to differentiate clinical reactivity from sensitisation. They are also used to check if a child has outgrown his/her food allergy. The risk of an oral food challenge includes severe allergic reaction such as anaphylaxis. We aim to describe the anaphylaxis outcomes in open food challenges conducted in the largest paediatric tertiary centre in Singapore.

Methods: We conducted a 5-year retrospective chart review of all open OFCs performed between 2018 to 2022, for the evaluation of IgE-mediated food allergies. Severity of allergic reactions were classified according to CoFAR grading system.

Result: A total of 1180 OFCs were conducted in children at a median age of 2.9 years (range 0.2-18 years). The five most common foods challenged were egg (35.1%), peanut (26.4%), tree nuts (15.8%), cow’s milk (10.8%) and wheat (6.4%). Overall, there were 271 (23.0%) failed challenges, of which 25 were anaphylaxis. The risk of anaphylaxis is highest in baked milk OFC, with odds ratio of 6.1 (95% CI 1.5-25). Most (88%) of the anaphylaxis reactions involved the respiratory system, while only 12% of cases involved the cardiovascular system. Anaphylaxis was treated with intramuscular adrenaline in 64% (16/25). There were no cases of severe anaphylaxis (Grade 4) and no mortalities (Grade 5).

Conclusion: The risk of anaphylaxis in a clinical OFC is approximately 2%. Centres conducting OFC must be adequately equipped and have personnel trained in the prompt recognition and treatment of anaphylaxis.
**WAC23-0175**

**Anaphylactic hypertension: reexamining the definition of anaphylaxis in adults and children who**

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**Background:** Anaphylaxis is the onset of symptoms in two or more organ systems within minutes to several hours after allergen exposure. If hypotension is present, this is a sign of a severe systemic reaction. In the literature, there is support for hypertension immediately after allergen exposure; driven by possibly a compensatory vasopressor response. Therefore, this study looks at redefining the definition of anaphylaxis by studying the vitals of adult patients (AP) and pediatric patients (PP) with anaphylaxis.

**Methods:** This is a retrospective cohort study on London Health Sciences Center (LHSC) emergency department patients between 2012-2022. Vitals of both PP and AP, with anaphylaxis, will be reviewed. In the AP, hypertension is a systolic blood pressure (sBP) above 140. In the PP, hypertension is a complex algorithm involving, sex, height, and weight; hypertension will be based on the American Academy of Pediatric Clinical Practice Guidelines.

**Result:** Preliminary data was collected on 664 AP and 278 PP. In the AP, 34% had a sBP greater than 140 at time of triage while 3% were hypotensive with a systolic less than 90. Average age was 43.8. Within the 224 patients, 12 were admitted to hospital, 1 died, 7 leaving after initial treatment and 204 formally discharged. In the PP, 25 were admitted with the average age being 9. 44% of the admitted PP were found to be hypertensive. No deaths in the 25 admitted PP.

**Conclusion:** This preliminary data shows that a proportion of AP and PP with anaphylaxis present to the emergency department with hypertension.
WAC23-0215
Real-life Outcomes of Epinephrine Prefilled Syringe Usage in Adult Anaphylactic Patients: A Retrospective Study on Epinephrine Emergency Kits

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Background: Anaphylaxis patients are advised to carry self-injectable epinephrine devices following the 2017 Thai national guideline. Due to limited availability of autoinjectors, epinephrine prefilled syringes (PFS) are commonly prescribed, with scarce real-life data on outcomes and usage in adult anaphylactic patients.

Methods: Objective: This retrospective study examines real-life outcomes in patients equipped with Epinephrine Emergency Kits (EE kits), focusing on recurrent reactions, PFS usage, outcomes, adherence, and confidence. Materials and Methods: Between January 2021 and December 2022, 320 anaphylactic cases received EE kits, with 275 cases analyzed. Nurse-led training programs evaluated knowledge, skill, confidence, and adherence at three-month intervals.

Result: At three months, 95.27% of patients achieved >80% knowledge scores, with 100% demonstrating correct injection skills. 89.45% self-reported carrying medications regularly, and 82.91% were confident in PFS usage. However, 22.18% (61/275) reported recurrent reactions, with only 57.37% (35/61) using PFS during reactions. Reasons for not using PFS included mild symptoms treated with self-medicated oral antihistamines (38.46%) and needle phobia (34.62%). 86.90% (239/275) had intact EE kits, while 13.10% (36/275) had flaws, such as premature epinephrine discoloration (44.45%), broken devices (22.22%), expired PFS (22.22%), and air bubbles in syringes (11.11%). Overall EE kit satisfaction was high (82.91%), with 16% reporting medium satisfaction and 1.09% indicating low satisfaction.

Conclusion: Continuous education, improved PFS usage, and enhanced adherence to EE kits are crucial for anaphylaxis management. Addressing knowledge gaps, providing support for needle phobia, and ensuring reliable epinephrine devices are vital for effective anaphylaxis management and patient safety.
WAC23-0276
Unveiling an Elaborate Presentation of Angioedema: Exposing a Grave Mimic

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Background: The prevalence of hereditary and acquired angioedema is increasing in Thailand. This case report underscores the intricate challenges involved in consultation and managing angioedema.

Case study: A 34-year-old female was referred from a community hospital suspecting Hereditary Angioedema (HAE). Over a month, she experienced gradual swelling on her face, lips, and eyelids. Corticosteroid treatment partially ameliorated the symptoms. However, taking an ibuprofen precipitated facial edema. While routine laboratory tests were mostly within normal limits, a slightly elevated C4 level was observed. A clinical diagnosis of HAE type 3 was established, leading to danazol therapy. Despite treatment, the swelling showed marginal improvement, prompting an assessment of C1q inhibitor function. The following day, she visited emergency department due to intensified swelling, hoarseness, and breathing difficulty. Even though Icatibant was administered, her symptoms deteriorated. A chest x-ray upon hospital admission unveiled a mediastinal mass. Subsequent CT scans identified a 7.3 cm anterior mediastinal mass obliterating the brachiocephalic vein and Superior Vena Cava (SVC). Biopsy confirmed a malignant small cell round tumor, immunohistochemistry supporting diffuse large B-cell lymphoma. Hematology & oncology were consulted for comprehensive management. Her symptoms have improved with systemic corticosteroids, and she is currently undergoing chemotherapy.

Conclusion: The initial appearance of angioedema unraveled a more profound underlying issue – SVC obstruction caused by diffuse large B-cell lymphoma. This report accentuates the significance of considering alternative diagnoses in cases of angioedema. Routine chest x-rays prove pivotal in diagnosing such cases, given their simplicity and non-invasive nature.
Patient-reported outcomes in hereditary angioedema by disease activity: Pooled results from the real-world ENABLE and EMPOWER studies

Dr. Daniel Nova Estepan¹, Dr. Daniel Nova Estepan¹, Dr. Ashley Yegin¹, Dr. Natalie Khutoryansky¹, Dr. Maureen Watt¹, Dr. Emel Aygören-Pürsün², Dr. Andreas Recke³, Dr. Tamar Kinaciyan⁴, Dr. H. James Wedner⁵, Dr. Aharon Kessel⁶, Dr. M. Dawn Goodyear⁷, Dr. Remi Gagnon⁸

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⁶Division of Allergy and Clinical Immunology, Bnai Zion Medical Centre, Technion Faculty of Medicine, Haifa, Israel
⁷Division of Hematology and Hematologic Malignancies, Cumming School of Medicine, University of Calgary, Calgary, AB, Canada
⁸Laval University, Centre Hospitalier Universitaire de Québec (CHUQ), Québec, QC, Canada

Background: Patients with hereditary angioedema (HAE) exhibit variable disease activity, components of which may include attack frequency. This analysis of pooled data from the real-world ENABLE (NCT04130191) and EMPOWER (NCT03845400) studies assessed patient-reported outcomes (PROs) by baseline disease activity.

Methods: Patients with HAE Type I/II aged ≥12 years with available baseline attack rate who received lanadelumab according to approved product labelling in the Phase IV ENABLE and EMPOWER studies were included. Subgroups were defined by baseline disease activity (attack rate/month; low: <1, moderate: ≥1 to <2, high: ≥2 to <3, very high: ≥3 attacks/month). PROs included the Angioedema Quality of Life (AE-QoL) questionnaire and the Angioedema Control Test (AECT).

Result: Overall, 122 patients (low disease activity: 21, moderate: 19, high: 15, very high: 67) were included. A clinically meaningful improvement (≥6 point decrease) in AE-QoL total score (mean±SD) from baseline to month 24 was observed in all 4 subgroups (low: 28.0±11.8 to 21.3±1.0; moderate: 32.0±14.0 to 10.3; high: 43.9±15.8 to 11.8±7.6; very high: 48.3±18.3 to 17.4±16.7). In all 4 subgroups, patient perception of well-controlled disease (AECT score ≥10) was achieved by month 3 and maintained up to month 24. The AECT scores (mean±SD) by subgroup for month 3 versus baseline, respectively, were 14.2±3.3 versus 12.8±3.0 (low), 14.8±2.2 versus 9.2±3.6 (moderate), 13.8±2.7 versus 6.8±1.8 (high), and 12.5±4.5 versus 6.2±3.1 (very high).

Conclusion: Regardless of baseline disease activity, lanadelumab treatment over 24 months in real-world patients with HAE resulted in a clinically meaningful improvement in health-related quality of life and a patient perception of well-controlled disease.
**WAC23-0158**

**Gefapixant efficacy and safety in participants with history of refractory or unexplained chronic cough for ≥1 vs <1 year**

Dr. Imran Satia¹, Dr. Imran Satia¹, Dr. Carmen La Rosa², Dr. George Philip³, Dr. Eduardo Urdaneta⁴, Dr. Lorcan McGarvey⁵, Dr. Jaclyn Smith⁶, Dr. Surinder Birring⁷, Dr. Susan Lu⁸, Dr. Paul Reyfman⁹, Dr. Allison Martin Nguyen¹⁰, Dr. Jin Xu¹⁰

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⁷Professor of Respiratory Medicine, Consultant Respiratory Physician, Centre for Human & Applied Physiological Sciences, School of Basic & Medical Biosciences, Faculty of Life Sciences & Medicine, King’s College London, London, UK
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¹⁰Sr. Principal Scientist, Merck & Co., Inc., Rahway, NJ, USA

**Background:** Gefapixant was studied in two phase 3 trials in individuals with refractory or unexplained chronic cough (RCC/UCC) for ≥1 year and a phase 3b trial in individuals with cough history >8 weeks and RCC/UCC for <1 year. Efficacy and safety after 12 weeks of treatment with gefapixant were compared between these populations with RCC/UCC for ≥1 vs <1 year.

**Methods:** Participants with RCC/UCC for ≥1 year (NCT03449134, NCT03449147; pooled) or <1 year (NCT04193202) who received gefapixant 45 mg twice daily or placebo were analyzed. Treatment differences vs placebo for changes from baseline in patient-reported outcomes (Leicester Cough Questionnaire [LCQ; primary endpoint for <1-year trial], cough severity visual analog scale [VAS], and Cough Severity Diary [CSD]) and safety were evaluated at Week 12. Trials were approved by institutional review boards.

**Result:** Demographics and baseline cough characteristics were similar (≥1 year: gefapixant, n=682; placebo, n=678; <1 year: gefapixant, n=206; placebo, n=209), except for chronic cough duration (mean [SD]: 11 [9] years vs 7 [3] months; median [range]: 8 [2, 65] years vs 8 [1, 12] months). Treatment differences vs placebo (95% CIs) were similar among those with RCC/UCC for ≥1 vs <1 year (LCQ: 0.71 [0.32, 1.11] vs 0.75 [0.06, 1.44]; cough severity VAS: -5.62 [-8.30, -2.95] vs -6.92 [-11.88, -1.97]; CSD: -0.43 [-0.66, -0.20] vs -0.47 [-0.88, -0.06]). For gefapixant, adverse event (AE) incidences were 80% (≥1 year) and 64% (<1 year); most taste AEs were mild or moderate.

**Conclusion:** Favorable responses to gefapixant were observed regardless of RCC/UCC duration.
WAC23-0159
Early cough severity changes over the first 4 weeks of treatment with gefapixant in two phase 3 studies

Dr. Surinder Birring¹, Dr. Surinder Birring¹, Dr. Carmen La Rosa², Dr. George Philip³, Dr. Eduardo Urdaneta⁴, Dr. Alyn Morice⁵, Dr. Peter Dicpinigaitis⁶, Dr. Qing Li⁷

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²Executive Director, Clinical Research, Merck & Co., Inc., Rahway, NJ, USA
³Executive Director, Medical Affairs, Merck & Co., Inc., Rahway, NJ, USA
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Background: Improvements in patient-reported cough severity visual analog scale (VAS) scores have been reported through 52 weeks of treatment with gefapixant in two phase 3 studies (COUGH-1/COUGH-2), but cough severity VAS changes earlier than 4 weeks have not been analyzed. Here, we assess changes in cough severity VAS scores over the first 4 weeks of treatment in COUGH-1 (NCT03449134) and COUGH-2 (NCT03449147).

Methods: Adults with refractory or unexplained chronic cough, chronic cough duration ≥1 year, and cough severity VAS ≥40 mm (100-mm scale) were enrolled. This post hoc analysis of pooled data from participants who received gefapixant 45 mg twice daily (BID) or placebo assesses changes from baseline in weekly mean cough severity VAS scores, collected daily from Weeks 1-12, with a focus on the first 4 weeks of treatment. COUGH-1 and COUGH-2 were approved by institutional review boards.

Result: A total of 682 and 678 participants were randomized to gefapixant 45 mg BID or placebo, respectively. With gefapixant, most (73%) of the cough severity VAS reduction at Week 12 (-27.6 mm) was evident by Week 4 (-20.1 mm). When examining changes from baseline in cough severity VAS scores for gefapixant, weekly differences vs placebo increased until Week 4 (Weeks 1-4: -4.8, -6.2, -7.9, and -8.1 mm, respectively); these differences were generally sustained from Weeks 5-12 (range: -6.5 to -8.0 mm).

Conclusion: This analysis suggests most cough severity VAS improvements through 12 weeks of treatment with gefapixant 45 mg BID are observed within the first 4 weeks.
Quality of German web-based health information for prevention and prediction of food allergy in children

Professor Christian Apfelbacher¹, Professor Christian Apfelbacher², Dr. Magdalena Rohr³, Dr. Susanne Brandstetter³, Dr. Madlen Hörold⁴, Mrs. Katharina Gerhardinger⁵, Mrs. Julia Weigt⁶

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⁶Sociologist, Otto von Guericke University Magdeburg, Germany

Background: Many parents seek health information online when they have received incomplete or incomprehensible information or feel a need to verify evidence. Therefore, the availability of high-quality online health information is important. This study aimed at systematically evaluating the quality of German-language, web-based health information on prevention and prediction of food allergy in children.

Methods: A systematic Google search was conducted in July 2022. We selected German-language, open-access health information on prediction and prevention of food allergy in children which were not labeled as advertisement. Quality was assessed using a comprehensive set of criteria including transparency, text design, content, language, frequencies and statistical information, visualisation and accessibility (Hasenpusch et al., 2022). Each category was rated as very good, good, mediocre, poor or very poor quality.

Result: We included 43 health information websites. 79% had an overall mediocre quality. No website was rated as good or very good in terms of accessibility. Only very few websites were rated as good or very good regarding transparency (7%) and content (19%). The presentation of frequencies and statistics had good or very good quality in 26% of websites. Language (90%), text design (100%) and visualisation (100%) fulfilled quality criteria in nearly all websites.

Conclusion: The quality of web-based health information is very heterogeneous. Further efforts are needed to improve digital health information for prevention and prediction of food allergy in children, especially with regard to accessibility, transparency, presentation of frequencies and statistical information and content.
Incidence and Prediction of Biphasic Reactions in Patients Initially Presenting and Treated at the Emergency Department

Dr. Ploylarp Lertvipapath¹, Dr. Mongkhon Sompornrattanaphan², Miss Waratchaya Uawattanasakul³

¹Pharmacist, Adverse Drug Reaction Unit, Division of Academic Affairs, Department of Pharmacy, Siriraj Hospital, Mahidol University
²doctor, Division of Allergy and Clinical Immunology, Department of Medicine, Faculty of Medicine Siriraj Hospital, Mahidol University
³pharmacist, Inpatient Pharmacy Division, Department of Pharmacy, Faculty of Medicine, Siriraj Hospital, Mahidol University, Bangkok

Background: Biphasic anaphylaxis despite successful treatment has an incidence of 4-5% based on NIAID/FAAN criteria. Our study aimed to investigate the frequency and predictive factors associated with biphasic reactions within the emergency department (ED) at Siriraj Hospital.

Methods: This observational cohort study assessed medical records of anaphylaxis and anaphylactic shock patients at Siriraj Hospital's ED from January 2015 to December 2019. Of these, a random sample was reviewed and validated by allergists. Telephone interviews were performed to collect more data. Uni- or biphasic response were analyzed descriptively. Prediction modeling were performed.

Result: Among 1888 ED anaphylaxis cases, 601 were randomly sampled, of which 239 patients completed interviews and were included in the final analysis. The incidence of biphasic reactions was 7.1% (17/239) of cases. Common triggers of biphasic responses were foods (47.1%), drugs (47.1%), other allergens (5.9%), and idiopathic causes (11.8%). Biphasic responses were significantly associated with history of drug allergy, any allergic disease, allergic rhinitis, number of prior anaphylactic reactions, angioedema, less generalized erythema, less reaction to shellfish, reaction to NSAID, and no adrenaline giving at ED visit (all p<0.1). From a 3-predictor prognostic model including drug/idiopathic reaction, duration from onset to first adrenaline >60 minutes, and any cutaneous edema/angioedema with an area under the curve of 0.72 (95%CI 0.54, 0.90), the presence of all predictors had a predicted probability of biphasic response of 21.3%.

Conclusion: The incidence of biphasic response was 7.1%. Predictors of biphasic response were drug/idiopathic reaction, any cutaneous edema/angioedema, and time from onset to first adrenaline >60 minutes.
Acute Food Allergic Reactions among Thai Children During the COVID-19 Pandemic

Miss Kamonlak Bawornsomboonkul¹, Miss Kamonlak Bawornsomboonkul¹, Miss Viranya Upapant², Assistant Professor Narissara Suratannnon³, Miss Pannipa Kittipongpattana³, Miss Rapisa Nantanee³, Associate Professor Pantipa Chatchatee³, Miss Parichat Khaosut⁴

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²General pediatrician, Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, Bangkok, Thailand
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⁴Pediatric rheumatology, Center of Excellence for Allergy and Clinical Immunology, Division of Allergy, Immunology and Rheumatology, Department of Pediatrics, Faculty of Medicine, Chulalongkorn University, King Chulalongkorn Memorial Hospital, the Thai Red Cross Society, Bangkok, Thailand

Background: The COVID-19 pandemic impacted people worldwide. Thailand was under lockdown from April to August 2021. Currently, there is no data on acute food allergic reactions and management of Thai children during the COVID-19 pandemic.

Methods: A Google form survey was distributed to parents of pediatric outpatients and inpatients in King Chulalongkorn Memorial Hospital during May 2022 to January 2023. All patients with IgE-mediated food allergy who live in Bangkok and the metropolitan areas were included.

Result: Eighty-two parents completed the survey. The number of food allergic reactions during lockdown was higher than before the pandemic (median 1 vs 0.43 per 5-month period, p=0.003) but fewer children were admitted during lockdown (4.3% vs 7.5%, respectively). Among the 10 children (12.2%) experiencing anaphylaxis during lockdown, only 20% were hospitalized and 20% consulted their doctors while treating the reaction at home. Home epinephrine injections were administered in 30% of all anaphylaxis cases and 42.8% of nonadmitted cases. One case (10%) did not seek medical advice but administered epinephrine at home. Factors significantly associated with acute food allergic reaction during lockdown were a history of allergic reaction within 1 year prior, difficulty preparing allergen-free food and limited medical access.

Conclusion: The incidence of food allergic reactions during lockdown is higher than before the pandemic. During lockdown, children with anaphylaxis could be treated safely at home with appropriate home anaphylaxis treatment and medical advice.
**WAC23-0168**

**Advanced computational system for detection and analysis of coughing.**

Professor Pawel Miotla¹, Professor Pawel Miotla¹, Dr. Dariusz Wojcik², Dr. Ewa Markut-Miotla³

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²AI engineer, 1. Faculty of Transport and Computer Science, WSEI University, 20-209 Lublin, Poland 2. Netrix S.A., Research & Development Centre, 20-704 Lublin, Poland
³MD, PhD, 1. Department of Lung Diseases and Children Rheumatology, Medical University of Lublin, 2. Tussis Sp. z o.o., Swidnik, Poland

**Background:** Cough detection and differentiation of its types are significant for diagnosis and course of numerous respiratory diseases.

**Methods:** The CoughApp project consists of a cough listening device and an application presenting the collected sound data. There are two analyses being performed - quantitative and qualitative. The quantitative one focuses on detecting cough sounds in the test sample and determining the number of them.

**Result:** Table 1 shows a comparison of MobileNet, RESNET-50 and Convolutional Neural Network models for the task. The second stage of research, the qualitative analysis, specifies the type of cough. The model predicts whether the cough is dry or wet. In order to find the optimal model classifying the type of cough in the source recording, MobileNet, MobileNetV2, NASNetMobile and DenseNet121 were compared (Table 2). Due to its small size, it is a deep learning model that can be used on mobile devices. Table 1. Cough detection – model performance comparison Model Accuracy AUC Precision Recall F1 MobileNet 89% 0.93 0.91 0.92 0.91 RESNET-50 85% 0.90 0.87 0.90 0.88 CNN 83% 0.88 0.86 0.87 0.87

**Conclusion:** CoughApp device may have potential application in medical research to diagnose respiratory diseases and assessment of implemented treatment. The use of artificial intelligence can be more effective and more accurate than traditional cough detection methods.
WAC23-0194
Viral Hepatitis affecting a female teenager with a debutting Type 3 Polyglandular Autoimmune Syndrome: a serendipitous Case Report

Dr. Raúl Alberto Montero Vázquez¹, Dr. Raúl Alberto Montero Vázquez¹

¹Pediatrician, Pediatric Allergy and Immunology Practitioner, Private

Background: The simultaneous expression of infectious and autoimmune diseases are events that can confuse medical practitioners, meaning the need of profound research.

Case study: 14-teen-year old female Mexican teenager, familial history of maternal Type 2 Diabetes Mellitus diagnosis, with personal history of Type 2 Diabetes Mellitus diagnosed on May 2021 and user of NPH insulin. In January 2023 begins with nausea, malaise, hyporexia and progressive jaundice, reason why is accepted at Renacimiento’s GH where is found with Hepatitis. At her fifth day is classified with grade III Hepatic Encephalopathy, reason why is transferred to our pediatric Intensive Care Unit (pICU). Once in our center she was managed at pICU with anti-ammonium managements, not requiring advanced respiratory support, being transferred to the Pediatric Unit afterwards. Infectious hepatitis causes were screened with Viral Hepatitis serologies and TORCH and, due to her past medical history, we searched for antinuclear antibodies, antiliver-kidney-smooth muscle antibodies, autoimmune thyroiditis antibodies and blood immunoglobulins levels. A positive IgM + Hepatitis A Virus serology was obtained along positive ANA (1:40), high IgG levels (1958 mg/dl), high anti-peroxidase antibodies (176.7 UI/ml). Three prednisone pulses and oral cyclosporine diminished hepatic function enzymes, aided the sleep cycle imbalance, and achieved defervescence. The patient was discharged 8 days after with ambulatory plan at other public health system.

Conclusion: Autoimmune diseases are tricky and mischievous pathologies that can express in different ages. Screening for other correlated pathologies must be considerate in some of them, but to never forget differential diagnosis.
**WAC23-0305**

**Perception and experience of medical professionals regarding allergy practices through hybrid learning techniques in India A cross-sectional study**

Dr. Balachandra B V¹, Dr. Balachandra B V¹, Dr. Jagdish Chinnappa¹

¹Doctor, Bangalore MedTrain LLP

**Background:** Technological advances are transforming medical education, and hybrid learning may affect specialised medical practises. This cross-sectional study examines Indian allergy doctors' opinions on hybrid learning. As medical education becomes more tech-driven, hybrid learning approaches mix classroom and online instruction. These models are versatile and engaging, but their use and results in specialised medical fields are unknown. Considering allergy management's multidisciplinary character and creating diagnostic approaches, hybrid learning, and medical expertise may be studied.

**Methods:** Data was collected from medical practitioners from various Indian healthcare settings through structured surveys and in-depth interviews to examine participants' views on hybrid learning's efficacy, obstacles, and effects on allergy management competencies. The mixed-methods approach helped explain this complex phenomenon.

**Result:** Preliminary data showed that medical professionals generally liked hybrid learning strategies for allergy practises. Interactive learning components in the hybrid framework increased engagement, participants said. The flexibility of learning schedules also helped balance professional obligations. However, technology accessibility and connectivity issues raised worries regarding fair access. Participants also wanted better peer collaboration and personalized mentoring, emphasizing the social aspect of medical education.

**Conclusion:** This cross-sectional study provides detailed insights into medical practitioners' perceptions and experiences with hybrid learning in allergy practises. The findings suggest hybrid learning could improve specialised medical education. Hybrid learning methodologies targeted to allergy management education may improve medical knowledge as the healthcare sector advances.
WAC23-0331
Vitamin D Deficiency as a Risk Factor for Head and Neck Cancer in dr. Hasan Sadikin Hospital Bandung

Dr. Melati Sudiro¹, Dr. Melati Sudiro¹, Dr. Yussy Afriani Dewi², Dr. Rina Desdwi Utami Sutarinda³

¹Otorhinolaryngologist, Staff of Rhinology- Allergy Division Faculty of Medicine Universitas Padjadjaran/dr. Hasan Sadikin Hospital Bandung
²Otorhinolaryngologist, Staff of Oncology Head and Neck Division Faculty of Medicine Universitas Padjadjaran/dr. Hasan Sadikin Hospital Bandung
³Otorhinolaryngologist, Ulin Hospital Banjarmasin

Background: Head and neck cancer is the fourth most common cancer in the world, such as the sinonasal tract, oral cavity, pharynx, and larynx. Over five years, there were 1,326 cases of head and neck cancer at Dr. Hasan Sadikin Bandung Hospital, and the prevalence of head and neck cancer was three times more common in men. Vitamin D is known to be a risk factor for cancer and plays an essential role in cancer. This study aimed to investigate the relationship between vitamin D levels and head-neck cancer risk.

Methods: Method: This was an observational study with a case-control approach. Our statistical analysis used the Mann‒Whitney test, a significance level with p<0.05.

Result: There were 156 research subjects divided into case and control groups. In the case group, there were 51 men and 29 women aged 46-55 years (40.0%). The most common location of cancer was the nasopharynx (65.0%). Vitamin D levels in the case group were mainly deficient in 42.5% of cases and severely in 25%, while the control group had predominantly normal vitamin D levels (39.5%). Analysis of the difference in the mean vitamin D levels of the two groups found that the control group (23.90 ng/ml) was higher than the cases (17.39 ng/ml) with p-value < 0.001, odds ratio 5.43 with 95% CI (2.37-12.47).

Conclusion: The risk of head and neck cancer is 5.43 times higher in people with a vitamin D deficiency than in people with normal vitamin D levels.
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Hiroshi Chantaphakul

Prof. Paul Jones

1 Dec 2023
12:00 - 13:00

World Ballroom B, FL23
Navigating the patient journey:
HAE diagnosis and management

FRIDAY, DECEMBER 1, 2023 | 12:00-12:55 (ICT)
World Ballroom A,
Centara Grand and Bangkok Convention Centre
at CentralWorld, Bangkok, Thailand

<table>
<thead>
<tr>
<th>Time (ICT)</th>
<th>Session</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>12:00-12:03</td>
<td>Welcome and introduction</td>
<td>Dr. Hilary Longhurst</td>
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<td>12:03-12:28</td>
<td>Exploring the challenges in HAE diagnosis&lt;br&gt;Expert discussion and Q&amp;A</td>
<td>Dr. Andrea Zanichelli&lt;br&gt;Dr. Hilary Longhurst and Dr. Andrea Zanichelli</td>
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<td>12:28-12:53</td>
<td>From guidelines to the clinic: adoption of LTP&lt;br&gt;Expert discussion and Q&amp;A</td>
<td>Dr. Hilary Longhurst&lt;br&gt;Dr. Hilary Longhurst and Dr. Andrea Zanichelli</td>
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<td>12:53-12:55</td>
<td>Meeting close</td>
<td>Dr. Hilary Longhurst</td>
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HAE, hereditary angioedema; LTP, long-term prophylaxis;
WAC, World Allergy Congress.

This symposium is initiated, organized, and funded by Takeda.
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VV-MEDMAT-93843 | Date of preparation: November 2023
LUNCHEON SYMPOSIUM:

THE NEW ERA OF CMPA MANAGEMENT TARGETING GUT MICROBIOTA

1st December 2023
12.00 – 13.00 pm
Centara Grand Central World
(Convention Center A, 22nd Floor)

Moderator: Prof. Jarungchit Ngampaiboon, MD
Division of Allergy & Immunology, Department of Pediatrics,
Chulalongkorn University, Bangkok, Thailand

SPEAKERS:

• Prof. Udo Herz, PhD
  Global Director Category Advocacy, Early Life,
  Danone - Specialized Nutrition Unit, Netherlands

• Prof. Anna H. Nowak-Węgrzyn, MD
  Director of the Pediatric Allergy & Immunology Division,
  Department of Pediatrics, NYU Langone Health,
  the Hassenfeld Children’s Hospital, New York, USA

• Assoc. Prof. Pantipa Chatchatee, MD
  Division of Allergy & Immunology, Department of Pediatrics,
  Chulalongkorn University, Bangkok, Thailand
Refractory and unexplained chronic cough: A disease on its own

Centara Convention Centre
Lotus Room 7
Bangkok, Thailand

Friday, 01 December 2023
12:00 – 12:55 (GMT+7)

Chair: Bryan Martin (USA)

Agenda

Introduction to the symposium and the faculty
Bryan Martin

A roundtable discussion featuring:

- Introduction to chronic cough, including refractory or unexplained chronic cough
- From chronic cough to RCC/UCC, the pathway to diagnose in the allergy clinic
- Chronic cough with common underlying conditions and refractory or unexplained chronic cough

Ignacio Ansotegui, Bryan Martin, Mario Morais-Almeida, Philip Rouadi

Q&A

Closing
Bryan Martin

Agenda may be subject to change pending speaker confirmation
Future Prospects of Immunization in Allergy & Airway Diseases Management

AGENDA

1.00 - 1.05 Opening & Objectives (Assoc. Prof. Hiroshi Chantaphakul, MD.)
1.05 - 1.15 The paradigm shifts of the role of the allergist in life course immunization (Assist. Prof. Sira Nanthapisal, MD., PhD.)
1.15 - 1.35 Adult Immunization: Innovation for prevention (Olakunle Oladehin, MD.)
1.35 - 1.45 Q&A (ALL)

GSK

WAC 2023
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FRI DAY

1 DEC 2023
AT 1.00 - 1.45 PM

ROOM LOTUS 5,6
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THE NOVEL THERAPIES FOR MODERATE-TO-SEVERE ATOPIC DERMATITIS PATIENT

- CHAIRPERSON -
  Dr. WASU KAMCHAI SATIAN

- SPEAKER -
  Prof. Dr. med. Dr. h. c. TORSTEN ZUBERBIE R

1st FRIDAY DEC 23
16.00-16.30
Venue: Centara Grand Hotel, Lotus 7, fl.22 (Room4)
You are cordially invited to:

ICS reduction strategies in Pediatric Asthma

Prof. dr. Ignacio Ansotegui
Chair & Welcome
Executive medical director World Allergy Organization (WAO),
Head of Department of Allergy and immunology, Hospital Quirónsalud, Bizkaia, Spain

Prof. dr. Alessandro Fiocchi
Treatment strategies in pediatric Asthma
Board member WAO,
Director of Allergy,
Pediatric Hospital Bambino Gesù, Rome, Italy

Prof. dr. Sandra Gonzalez
ICS reduction with doxofylline - Clinical results
Board member WAO,
Director center for allergy and clinical immunology,
University Hospital Monterrey, Mexico

WAC symposium - December 1st - 16:40-17:10
Room 4 (Lotus 7) - Floor 22
WAC 2023 | World Allergy Congress
December 1-3, 2023 | Bangkok, Thailand

Updating Allergy Management
Sanofi Satellite Symposium

- December 2, 2023 | 12:00 to 12:55 ICT (UTC+7)

Introduction
- Chairperson | Bryan Martin | (United States)
  12:00-12:03

At what extent climate changes and air pollution are affecting allergic sufferers?
- Ignacio J. Ansotegui | (Spain)
  12:03-12:18

Treating allergic rhinitis symptoms on time
- Anne K. Ellis | (Canada)
  12:18-12:33

The most adapted treatment for allergic kids
- José Antonio Ortega Martell | (Mexico)
  12:33-12:48

Q&A - Concluding Remarks
- All
  12:48-12:55
You're cordially invited to join AstraZeneca Luncheon symposium at

WORLD ALLERGY CONGRESS (WAC) 2023

REMISSION IN SEVERE ASTHMA
An achievable treatment goal in the biologics era

Moderator
ASSOC. PROF. HIROSHI CHANTAPHAKUL
King Chulalongkorn Memorial Hospital, Thailand

Speaker
PROF. PAUL O’BRYNE
Faculty of Health Sciences, McMaster University, Canada

2nd SATURDAY
DEC 2023 | TIME
12:00 - 13:00

WORLD BALLROOM A
CENTARA GRAND AT CENTRALWORLD
New AIT Options to Overcome the Global HDM Respiratory Allergy Problem

ALK Lunch Symposium
02.12.2023 | 12:00-13:00 hrs.
World Ballroom C, Room 3, 23rd floor, Centara Grand at Central World Hotel, Bangkok

CHAIRPERSON: PROF. MOISES CALDERON, M.D., PH.D.

SPEAKER PROF. SUPINDA CHUSAKUL, M.D.
HDM Allergic Rhinitis: From Global Epidemiology to Optimizing Diagnosis in Polyallergic Patients

SPEAKER PROF. MOISES CALDERON, M.D., PH.D.
HDM SLIT-Tablet as the Emerging Treatment for HDM Respiratory Allergy

SPEAKER PROF. MOTOHIRO EBISAWA, M.D.
HDM Allergic Rhinitis in Children and the Efficacy of HDM SLIT-Tablet
YOU ARE CORDIALLY INVITED TO JOIN

MINI SATELLITE SYMPOSIUM 4

Anti-IgE in IgE-Related Chronic Diseases

SATURDAY 2 DEC 2023

13.00-13.30

Lotus 7, fl.22, Centara Grand & Bangkok Convention Centre at Centralworld, Bangkok

SPEAKER

Assoc. Prof. Hiroshi Chantaphakul, M.D., FAAAAI, Thailand.
LTRA IN ASIA: UNVEILING EFFICACY AND SAFETY INSIGHTS

📅 2 December 2023
13:30-14:00

At Lotus Suite 7 room, 22nd Floor
Centara Grand at CentralWorld

Assoc. Prof. Pantipa Chatchartee
Division of Allergy & Immunology,
Department of Pediatrics,
Chulalongkorn University, Thailand

Prof. Hyo Bin Kim
Allergy & Pulmonology Division,
Department of Pediatrics,
Inje University Sanggye Paik Hospital, Korea

TH-SNG-11088C 11/2023
HUNGER IN THE MIDST OF ABUNDANCE: regulating precautionary allergen labelling

Satellite Symposium

Chaired by:
Prof. Motohiro Ebisawa
Prof. Bryan Martin

Speakers:
Prof. Gary Wong
Living with severe food allergy

Prof. Alessandro Fiocchi
PAL: clinical and regulatory aspects after the FAO/WHO consultation on risk assessment of food allergens

Prof. Linda Monaci
Food Allergen Quantification

VENUE: Centara Grand and Bangkok Convention Centre at CentralWorld
THAILAND, BANGKOK

SAVE the DATE
DECEMBER 2nd, Saturday
16:00 - 17:15 UTC/GMT +7 hours
Menarini Group Symposium

Place in therapy of Bilastine: from guidelines to real-life

December 3rd from 12.00 pm to 12.55 pm
SERETIDE
Device flexibility¹,²

For regular treatment of
Asthma & COPD from age
4 years and older¹,²

Accuhaler²
1 inhalation of Sal/FP 50/100 or
50/250 or 50/500 BID
• Individual dose counter
• Pre-filled blister

Evohaler¹
2 inhalations of Sal/FP 25/50 or 25/125
or 25/250 BID
• Individual dose counter

¹ 2008 GLS. ² 2009 & 2011 GLS.
Mitra study shown that Acarizax can reduce risk of moderate or severe asthma exacerbation during ICS reduction/withdrawal.

Kaplan-meier plot

- Probability of % of free moderate or severe exacerbation
- Number of subjects still at risk
- Time (days) during ICS reduction

34%

Efficacy 12 SQ-HDM over placebo
Any exacerbation, moderate or severe (FAS)
Hazard ratio [95% CL]
0.66 [0.47; 0.93]
Risk reduction 34%
p-value 0.017

Onset of the clinical effect is to be expected 8-14 weeks after initiation

The recommended dose for adult and adolescents (12-17 years) is one oral lyophilisate (12 SQ-HDM) daily.
Demonstrate significant improvements in all clinical outcome measures regardless of baseline characteristics\(^1\)

- Benralizumab reduced the risk of exacerbations, minimized OCS use, improved asthma control and quality of life\(^1\)
- The benefits of Benralizumab were independent of previous experience with biologic therapy, FENO concentrations, and atopic status\(^1\)
- In patients with severe, uncontrolled eosinophilic asthma, long-term Benralizumab was safe and well tolerated for up to 5 years\(^2\)


The Only eHF with Synbiotic

FAST & EFFECTIVE

CMPA RELIEF IN 7 DAYS*

*Based on significant improvement of FENO values among CMPA patients with severe eosinophilic upper airway disease treated with Pepti Hi-Q Synbiotic. Data on file. Pepti Hi-Q Synbiotic is a prescription medicine for infants 6 months to 12 years of age for the treatment of CMPA. Do not use for infants with galactosemia (a rare genetic disorder).