I was on an elimination diet

Food allergies

““I was on an elimination diet”

Update on food allergy

• Introduction
• Epidemiology
• Current management of food allergy
• New approaches in children
• Advances in adults
• New laboratory approaches

Paediatric Allergy SIG

IgE-mediated food allergy—diagnosis and management in New Zealand children
J Sinclair, S Brothers, P Jackson, T Stanley, M Ang, P Brown, A Craig, A Daniell, C Docecy, S Hoare, S Lester, P McIlroy, G Onsting, D Parvis, J Sanders, R Simkley, M Sutherland, T Townsend, J Wilde, G Williams
Adverse Reactions to Food

Toxic (eg. Ciguatera) Non Toxic

Immune (Food Allergy) Non Immune (Food Intolerance)

IgE Non-IgE Enzymatic Chemical Pharmacologic
(eg eczema) (eg celiac) (eg lactase) (eg salicylate) (histamine)

Unknown Food Aversion

Food allergens

• When food allergy is confirmed, it mostly proves to be restricted to 1 or 2 foods
• Young children: milk, egg, peanut, tree nuts, soy, and wheat account for about 90% of cases
• Adolescents and adults: peanut, fish, shellfish, and tree nuts account for about 85%
• Cultural variation eg rice in Japan, increasing sesame allergy in NZ and Australia
• New allergens incl Anisakis, Lupin, Tick bites

Pilot study of Plunket Clinics in Auckland

FA symptoms

• FA symptoms 11/96
• Males: females 4:7
• Diagnosed by specialist 3
• Diagnosed by GP (no testing) 2
• FA symptoms only 6
• Ethnicities: NZE, Maori, Indian, Chinese, Niuean
**Pilot study of Plunket Clinics in Auckland**

**Eczema**
- Eczema: 30%
- Treated by GP: 17%
- NZ Health survey: 14% with eczema
- Some mothers changed own diet while breast feeding and found eczema improved.

**Healthnuts study Melbourne 1 yr olds**

**Peanut sensitisation/allergy**: 8.9/3
- **Egg sensitisation/allergy**: 16.5/8.9
- **Milk**: 5.6
- Community based
- Followed by food challenges

**Pathogenesis**

IgE — Non-IgE

- Anaphylaxis/angioedema
- Gastrointestinal anaphylaxis
- Oral Allergy Syndrome
- Eczema
- Allergic Eosinophilic Esophagitis,
- Gastritis & Gastroenteritis
- Dietary protein colitis,
- Proctitis and enteropathy
- [Celiac Disease]
### Case presentation

- 2 y old child
- Fed peanut butter toast by 3 old sib
- Anaphylaxis - throat symptoms, cough etc
- Anaphylaxis treated and referred back.
- Referral sent to specialist

### Case presentation

- Thorough history incl time to reaction
- Distinguish between allergy and sensitivity
- Risk of breaking tolerance
- Physical findings
- Testing
- Long-term management plan

### Emergency management plan

- Written action plan: ASCIA
- MEDIC-ALERT emblem > 5 yrs velcro
- Public Health nurses to visit school/daycare
- Anaphylaxis video
- Training on using the autoinjector
### Skin testing

![Skin testing image]

### Specific IgE testing

<table>
<thead>
<tr>
<th>Food</th>
<th>cut-off</th>
<th>sensitivity</th>
<th>specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Egg</td>
<td>6.0 U/ml</td>
<td>61%</td>
<td>92%</td>
</tr>
<tr>
<td>Milk</td>
<td>15 U/ml</td>
<td>51%</td>
<td>98%</td>
</tr>
<tr>
<td>Peanut</td>
<td>15.0 U/ml</td>
<td>73%</td>
<td>92%</td>
</tr>
<tr>
<td>Fish</td>
<td>19.5 U/ml</td>
<td>40%</td>
<td>99%</td>
</tr>
<tr>
<td>Wheat</td>
<td>&gt; 100 U/ml</td>
<td>PPV</td>
<td>60%</td>
</tr>
<tr>
<td>Soy</td>
<td>&gt; 100 U/ml</td>
<td>PPV</td>
<td>&lt; 50%</td>
</tr>
</tbody>
</table>
Determinants of the severity of a reaction

- Sensitivity (levels of food specific IgE)
- Amount of food consumed
- Digestion: use of antacids
- Absorption rate (slowed by charcoal)
- Co-factors (virus, aspirin, exercise, alcohol)
- Sensitivity may or may not increase with subsequent exposures (memory)
- Allergenicity: Hyperallergenic foods
Food allergen avoidance/ Long-term elimination diets

• Accurate diagnosis is critical
• Paediatric dietician assessment essential
• Reading food labels
• Allergy New Zealand incl e-mail alerts

Nutritional risks of long-term elimination diets

<table>
<thead>
<tr>
<th>Allergen</th>
<th>Vitamin and Minerals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk</td>
<td>Vitamin A, vitamin D, riboflavin, pantothenic acid, vitamin B12, calcium, &amp; phosphorus</td>
</tr>
<tr>
<td>Egg</td>
<td>Vitamin B12, riboflavin, pantothenic acid, biotin, &amp; selenium</td>
</tr>
<tr>
<td>Soy</td>
<td>Thiamin, riboflavin, pyridoxine, folate, calcium, phosphorus, magnesium, iron, &amp; zinc</td>
</tr>
<tr>
<td>Wheat</td>
<td>Thiamin, riboflavin, niacin, iron, &amp; folate if fortified</td>
</tr>
<tr>
<td>Peanut</td>
<td>Vitamin E, niacin, magnesium, manganese, &amp; chromium</td>
</tr>
</tbody>
</table>

Food allergen avoidance/ Long-term follow up

• Follow up specific IgE testing 6-12 monthly
• Food challenge if sp IgE becomes negative
• Continue to eat previous allergic food
• Restesting to ensure results decreasing
Natural History of food allergy

- Milk and egg allergy improve over time
- Once remission occurs, no recurrence
- Taste may be an issue
- Recent data suggesting milk allergy may persist into adolescence
- 20-30% of peanut allergy remits: serial tests
- Up to 9% of children with tree nut allergy remit

Food allergy as a trigger for eczema

- Food allergy; trigger for eczema in 1/3
- 470 children with eczema studied at JHU
- Admitted to the unit to clear their eczema
- 1776 challenges undertaken (3-4/patient)
- 1/3 had positive reactions (714 challenges)
- Reactions: Skin 74% (529), GI 50% (358), Resp 45% (322)
- All reactions occurred within 2 hours

The future of food allergy

- Avoidance of foods - current standard of care
- Baked egg and milk challenges
- Neonatal prevention studies - ongoing
- Anti IgE studies TXN901, Omalizumab
- Peanut and other food desensitisation
- Modified allergens
- Chinese herbal preparation
- Combinations of above
- ???
Anti-IgE therapy

- Recent study with TNX 901 showed anti-IgE therapy can markedly improve peanut allergy
- Threshold doses increased from 1/2 peanut to 8 peanuts
- Lawsuit-project discontinued
- Study discontinued Omalizumab (Xolair)

Leung et al NEJM 2004

Case history #2

- John aged 28 years
- Three episodes of anaphylaxis while playing rugby
- Has been able to play rugby at other times
- What is the DDx?
- What other information do we need
- Are lab tests helpful?

Food-dependent exercise induced anaphylaxis

- Anaphylaxis occurs if individual exercises within 2 hrs of eating the food to which he/she only mildly-moderately allergic to
- No reaction if food eaten without exercise
- Common foods: wheat, seafood, chicken, celery
- Other cofactors: aspirin, alcohol
- Usually SPT/spIgE positive to the food
- Up to 25% of anaphylaxis associated with exercise
Case #3

- Chen 18yrs old
- Gradually increasing dysphagia and reflux
- Saw gastroenterologist and was prescribed Omeprazole
- No response
- Food bolus obstruction
- Gastroscopy showed inflammation
- Histology eosinophil infiltration
- Referred to allergist: skin test + for chicken

Allergic eosinophilic esophagitis/gastroenteritis

- Form of food allergy
- Responds poorly to standard reflux treatment
- Eosinophils in blood or esophagus
- May have a food allergy trigger
- Elimination of food and steroids required for treatment
- Inadequate treatment may lead to permanent stricture of esophagus
- Can affect other parts of the gut
- New six food elimination diet
- ECP