

Management of Atopy and Anaphylaxis: is there an allergy epidemic?

R. BORICI-MAZI, MD FRCPC

ASSISTANT PROFESSOR OF MEDICINE AND PAEDIATRICS

DIVISION OF ALLERGY AND IMMUNOLOGY

QUEEN'S UNIVERSITY

Disclosures

Faculty: Rozita Borici-Mazi

Relationships with commercial interests:

- **Grants/Research Support: CSL Behring**
- **Speakers Bureau/Honoraria: GlaxoWelcome, Takeda, Meck**
- **Consulting Fees: CSL Behring, Viropharma**
- **Other: None**

Potential for conflict(s) of interest:

- **I have no conflict of interest to disclose as related to this presentation.**

Allergy Statistics

Allergic Rhinitis

Roughly 7.8% of people 18 and over in the U.S. have hay fever.⁴

In 2010, 10% of U.S. children aged 17 years and under suffered from hay fever in the past 12 months.¹

Worldwide, allergic rhinitis affects between 10% and 30 % of the population.³

Worldwide, sensitization (IgE antibodies) to foreign proteins in the environment is present in up to 40% of the population.³

References

1. Bloom B, Cohen RA, Freeman G. *Summary health statistics for U.S. children: National Health Interview Survey, 2010*. National Center for Health Statistics. Vital Health Stat 10(250). 2011.
2. World Health Organization. *White Book on Allergy 2011-2012 Executive Summary*. By Prof. Ruby Pawankar, MD, PhD, Prof. Giorgio Walker Canonica, MD, Prof. Stephen T. Holgate, BSc, MD, DSc, FMed Sci and Prof. Richard F. Lockey, MD.
3. *Summary Health Statistics for U.S. Adults: National Health Interview Survey, 2010*. By Jeannine S. Schiller, M.P.H., Jacqueline W. Lucas, M.P.H., Brian W. Ward, PhD and Jennifer A. Peregory, M.P.H., Division of Health Interview Statistics.

Allergy Statistics

Food Allergy

Findings from a 2009 to 2010 study in USA of 38,480 children (infant to 18) indicated:

Overall prevalence : 8% have a food allergy

- ❖ Approximately 6% aged 0-2 years have a food allergy
- ❖ About 9% aged 3-5 years have a food allergy
- ❖ Nearly 8% aged 6-10 years have a food allergy
- ❖ Approximately 8% aged 11-13 years have a food allergy
- ❖ More than 8.5% aged 14-18 years have a food allergy
- ❖ 38.7% of food allergic children have a history of severe reactions
- ❖ 30.4% of food allergic children have multiple food allergies
- ❖ Of food allergic children, peanut is the most prevalent allergen, followed by milk and then shellfish

References Gupta, R, et al. The Prevalence, Severity and Distribution of Childhood Food Allergy in the United States. *Pediatrics* 2011; 10.1542/ped.2011-0204

Allergy statistics

Based on self-reported data, the prevalence of food allergies in Canada is estimated to be approximately 7%

References:

Soller L, Ben-Shoshan M, Harrington DW, et al. Overall prevalence of self-reported food allergy in Canada. *J Allergy Clin Immunol* 2012;130(4):986-8.

Prevalence of Paediatric Food Allergies

Perception by public: 20-25%

Published data based on results of oral food challenges

<u>Food</u>	<u>Young children</u>
Milk	2.5%
Egg	1.3%
Peanut	0.8%
Tree Nuts	0.2%
Fish	0.1%
Shellfish	0.1%
Overall	6%



Food Allergy Prevalence in other disorders

<u>Disorder</u>	<u>Food Allergy Prevalence</u>
Anaphylaxis	35-55%
Oral Allergy Syndrome	25-75% in pollen allergic
Atopic Dermatitis	37% in children
Urticaria	20% in acute (rare in chronic urticaria)
Asthma	5-6% of asthmatic or food allergic children
Chronic Rhinitis	Rare

Why are food allergies increasing?

Hygiene hypothesis

Delayed introduction of foods

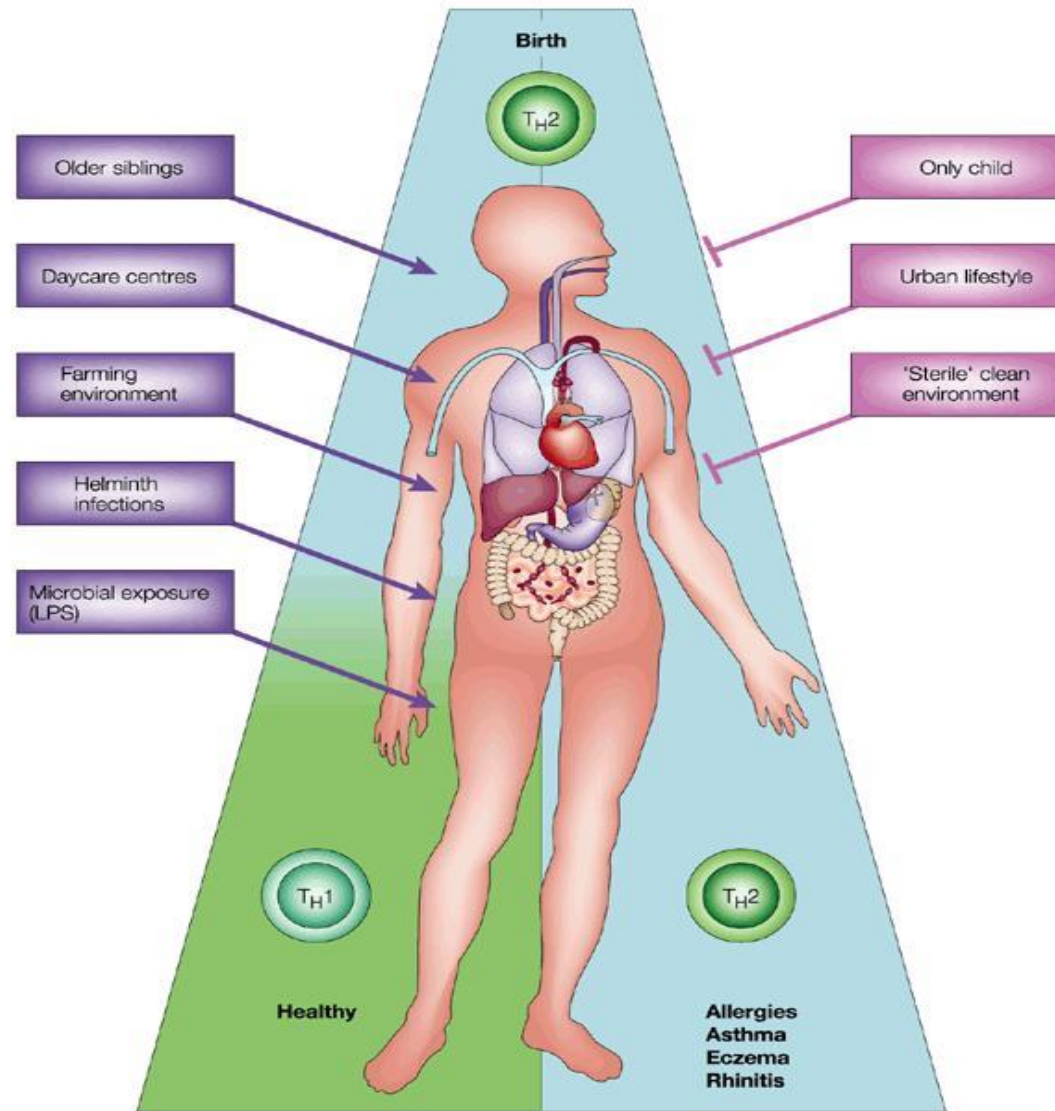
Form of food we eat - Dietary composition

Increase awareness and reporting

Antiacids

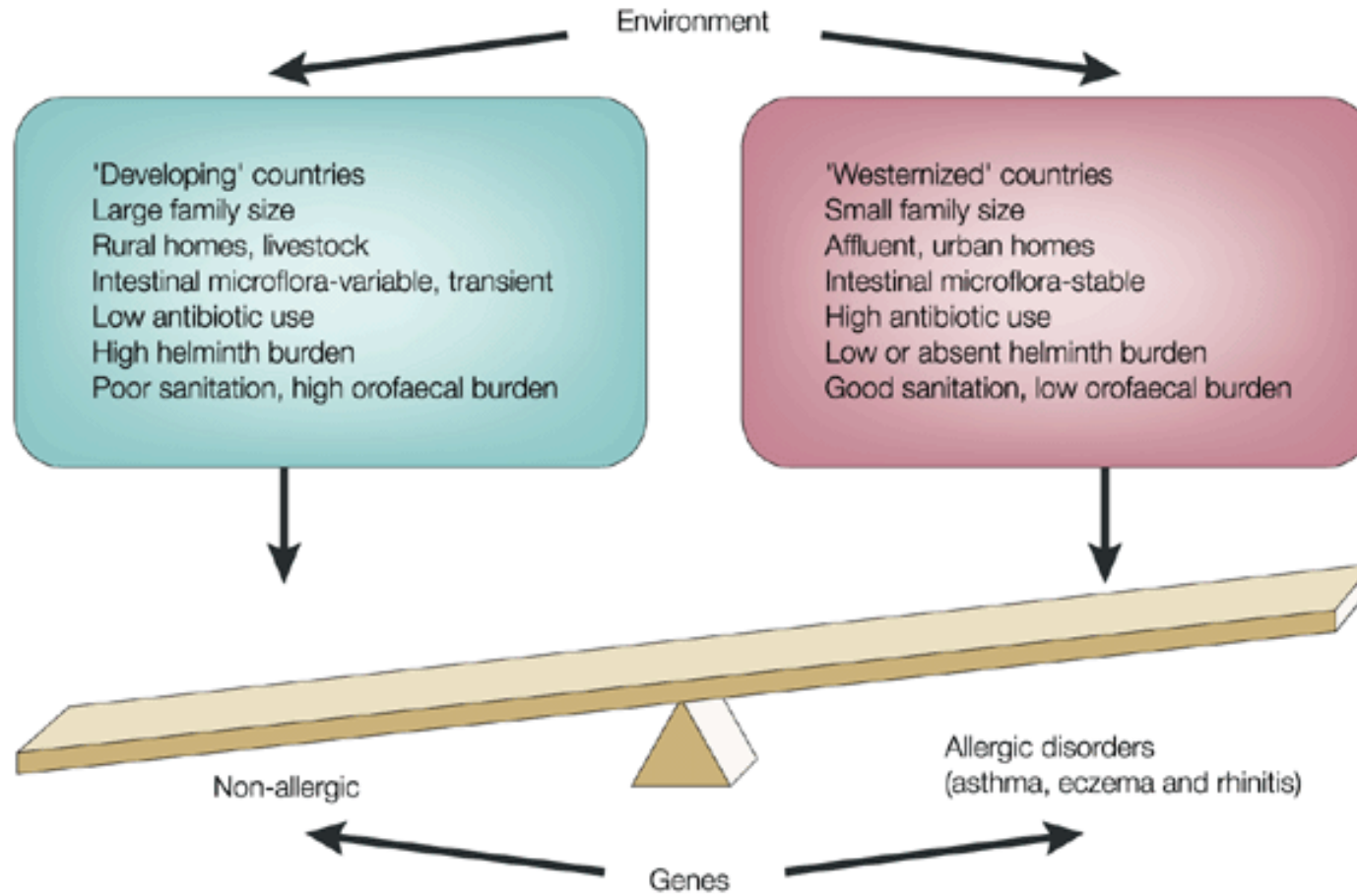
Why are Allergies Increasing?

THE HYGIENE HYPOTHESIS



Why are Allergies Increasing?

THE HYGIENE HYPOTHESIS



Why are food allergies increasing?

Hygiene hypothesis

Delayed introduction of foods

Form of food we eat - Dietary composition

Increase awareness and reporting

Antiacids

Case 1

28 year old female comes for prenatal visit. She is 12 weeks pregnant with her first baby. She has a history of eczema, asthma and environmental allergies.

1. She is asking advise regarding her diet during pregnancy and lactation in order to prevent development of allergies in her newborn baby.
2. She is planning to breastfeed and is asking advise regarding duration of lactation.
3. If she will not be able to breastfeed, which formula would be best?

Food allergy prevention-evolving concept

Dietary exposures and allergy prevention in high-risk infants

A joint statement with the Canadian Society of Allergy and Clinical Immunology

Edmond S Chan, Carl Cummings; Canadian Paediatric Society

Community Paediatrics Committee, Allergy Section

Paediatr Child Health 2013;18(10):545-9



Case 1- Resolution

Evidence to support maternal dietary restrictions during pregnancy

and lactation to prevent allergies, is contradictory and insufficient to change best practice.

Peanut avoidance during pregnancy-retrospective and inconclusive

Restricting diet during lactation has prevented eczema ONLY

Canadian Pediatric Society (CPS) and WHO recommend 6 months exclusive breastfeeding. The role of breastfeeding in preventing allergy remains unclear.

? Beneficial to prevent atopic dermatitis or wheezing before age of 4

No clear recommendations for choice of formula can be made, given the lack of conclusive evidence related to allergy prevention.

Extensively hydrolyzed casein formula is more likely to be effective in preventing atopic dermatitis in high-risk infants than partially hydrolyzed whey formula.

Soy formula does not have a role

Early introduction of intact cow's milk formula may help developing tolerance - unclear

Case 2

28 year old female is seen in the office with her baby girl of 4 months of age. She has another 6 year old son.

She is asking about introduction of solid foods

What additional information should be obtained from her history?

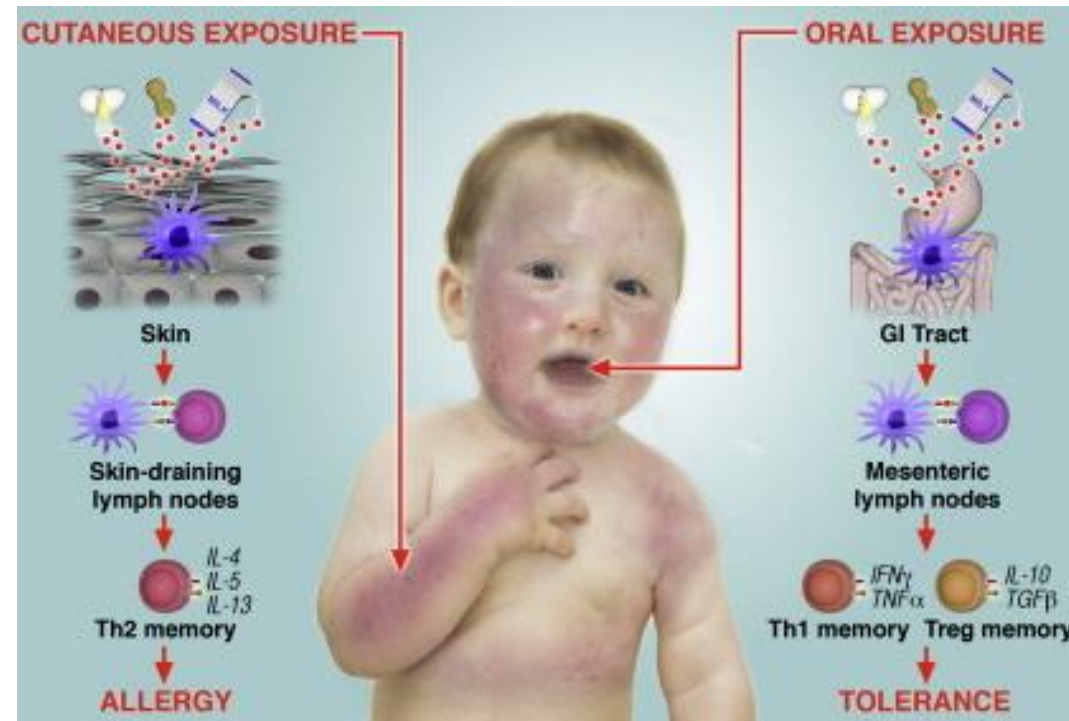
Food Allergy Prevention-?

Food Allergies among Allergy Clinic Patients

Country	Peanut Allergy %	Dietary Practice recommendation
United Kingdom (n=991)	25	Avoidance
United States (n=300)	69	Avoidance
Israel (n=994)	2.1	High Infant consumption
Philippines (n=184)	0	High infant consumption

Dual allergen exposure hypothesis for pathogenesis of food allergy

Lack, Gideon. Epidemiologic risks for food allergy. JACI June 2008



Food Allergy Prevention-Evolving concept

Introduction of allergenic foods in atopic families (parents or siblings with food allergies, other atopic conditions, eg. eczema)

In January 2008, the American Academy of Pediatrics noted:

"no current convincing evidence that delaying their introduction beyond [the age of four to six months] has a significant protective effect on the development of atopic disease." (dairy, eggs, nuts)

Current AAP's stance is: dairy, eggs, peanuts, tree nuts, and seafood are safe to be introduced at the same time as the introduction of other foods

Greer, Frank R., et al. "Effects of Early Nutritional Interventions on the Development of Atopic Disease in Infants and Children: The Role of Maternal Dietary Restriction, Breastfeeding, Timing of Introduction of Complementary Foods, and Hydrolyzed Formulas" *Pediatrics*. Jan. 2008 121(1): 183-91. 14 Jan. 2008.

Food allergy prevention-evolving concept

Dietary exposures and allergy prevention in high-risk infants

A joint statement with the Canadian Society of Allergy and Clinical Immunology

Edmond S Chan, Carl Cummings; Canadian Paediatric Society

Community Paediatrics Committee, Allergy Section

Paediatr Child Health 2013;18(10):545-9



Case 2- Resolution

Points of Interest

Do not delay the introduction of any specific solid food beyond six months of age. Later introduction of peanut, fish or egg does not prevent, and may even increase, the risk of developing food allergy. (Evidence II-2B).

Deciding whether to introduce potentially allergenic solid foods to high-risk infants early should be individualized and based on parental comfort level.

History of a sibling with a food allergy(peanut) or parents' request to introduce the food after being assessed by an allergist should be taken into account.

Why are food allergies increasing?

Hygiene hypothesis

Delayed introduction of foods

Form of food we eat - Dietary composition

Increase awareness and reporting

Antiacids

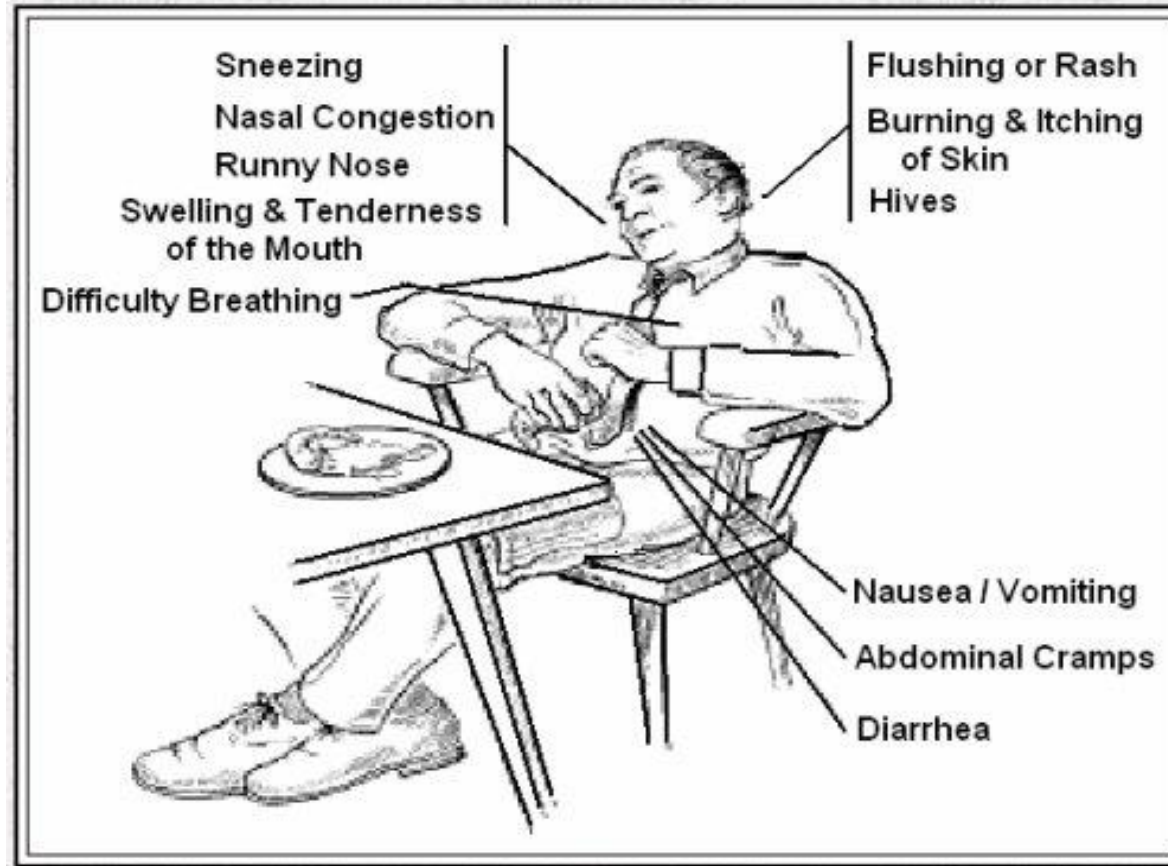
Case 3

16 month old female is seen in the office. Her Mom report a history of vomiting after eating eggs over past 2 months. No other symptoms are noted.

What additional information would you elicit?

Food Allergy- Symptoms

Think about an Allergist Referral



Diagnosis: History and Physical

History: symptoms, timing, reproducibility

- Acute reactions vs chronic

Diet details / Food Record

- Specific causal food (s)
- “Hidden” ingredient (s) fillers (carrageen, spices, etc)

Physical Exam: Nutritional status, Signs of underlying atopic condition

Diagnosis-Laboratory Evaluation

Suspect IgE-mediated

- Prick tests (PPV 50%, NPV 95%)
- Serum Food specific IgE Ab

Suspect non IgE-mediated

- Atopy Patch testing with foods
- Referral to Gastroenterology (biopsy of gut)

Diagnostic Decision Points (Food Specific IgE in kU/L)

Sicherer & Sampson JACI Primer 2006 (based on US studies)

Food	Mean Age	Mean Age	Age < 2 yrs
	5yrs • ~ 50% react	5 yrs ~ 95% react	~ 95% react
Egg	2	≥ 7	≥ 2
Milk	2	≥ 15	≥ 5
Peanut	2-5	≥ 14	--

Treatment: Dietary Elimination

First step in Management

- Be aware of Hidden ingredients
- Food Labelling-ambiguous terms
 - natural flavours
- Cross contamination
 - shared equipment

Seeking Assistance

- Registered dietician
- Written materials, cooking recepies

Treatment: Emergency Medications

Epinephrine: Drug of choice for treatment of reactions

- Self-administered epinephrine readily available
- Dosing 0.15mg or 0.30mg IM (switch over 20-25 kg)
- Appropriate training-Indication/technique

Antihistamines: Secondary therapy

Emergency Plan (schools, caregivers)

Medic Alert bracelet

Treatment: Follow up

Re-evaluate for tolerance periodically

Interval and decision to re-challenge depends on:

- Type of food allergy
- Severity of previous symptoms
- Allergen

Ancillary Testing

- Repeat prick testing/serum specific IgE

Treatment: Follow up

Re-evaluate for tolerance periodically

Interval and decision to re-challenge depends on:

- Type of food allergy
- Severity of previous symptoms
- Allergen

Ancillary Testing

- Repeat prick testing/serum specific IgE

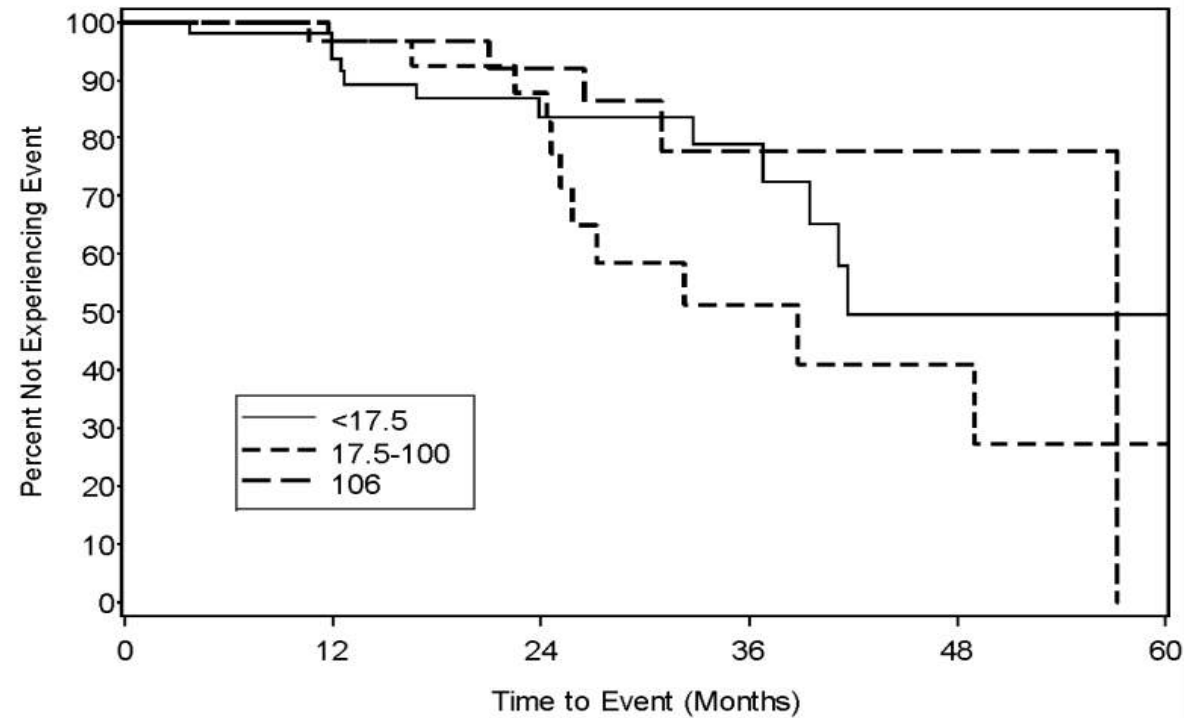
Natural History

IgE-mediated Food Allergy

- *85% of Cow's Milk, Egg, Soy, Wheat allergy* typically resolves by age 5 yrs – therefore yearly/biyearly assessment
- *Peanut, Tree Nuts, Seafood, Fish* typically persists:
 - Resolution rate for Peanut Allergy is 20% for young children, 10% for Tree Nuts, 10% Seafood and Fish allergy
 - Re occurrence of peanut allergy 7-9%, increased risk if avoidance is applied.

Monitoring Peanut Allergic Patients with Peanut Specific IgE

Borici-Mazi, R. et al Allergy Asthma Proc 2008 May-June



Figure

Decline rate (%) of PN-IgE as determined by baseline values. a) <17.5 kU_A/L, b) 17.5-100 kU_A/L c) >100 kU_A/L (106).

Natural history

Non-IgE Mediated GI allergy-Food protein induced enterocolitis

Infant forms resolve by 1-3 years

- Assess severity/risks and plan re-challenge at home or in supervised setting

Toddler forms-more persistent

Summary

History paramount for diagnosis

Recognize IgE and non-IgE associated conditions

Diagnosis is based on judicious testing, elimination and challenges when indicated

Avoidance/education/preparation for emergencies are current therapies

Periodic follow up

Questions
