

Allergies in children

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Definitions

- Allergy - adverse reaction to a substance mediated by an immunological response
- Intolerance - reproducible adverse reaction to a substance with no immunological (or psychological) basis
- Anaphylaxis - severe allergic reaction of rapid onset with a systemic response which is life-threatening (circulatory collapse, severe breathing difficulties)

Causes

- Foods -Cow's milk and egg, nuts especially peanuts, soya, wheat, fish, shellfish, legumes, fruit
- Pollen, animal dander, house dust mite
- Insect stings
- Drugs
- Natural rubber latex

Symptoms

- Oral - tingling, burning, itching
- Sneezing, runny eyes or nose
- Cutaneous - pruritis, erythema, urticaria, angio-oedema
- Unwell- irritable, fearful
- GI tract - nausea, vomiting, abdo pain
- Resp -upper airway obstruction from angiooedema, bronchospasm
- Cardiovascular collapse from hypotension, arrhythmias - dizziness, pallor, syncope, confusion, LOC

Symptoms 2

- Occur within a few minutes to several hours
- Majority within first hour
- Can be bi-phasic
- Exercise induced

Epidemiology

- Peanuts -1-1.5% children aged 5 have had a reaction to peanuts.
- Cow's milk allergy/intolerance –6%
- Egg – 2%
- In USA - 28% of under 3 years reported to have intolerance, confirmed in 8%, most tolerated offending food by 3years
- Most children are atopic

Epidemiology 2

- Fatal or near fatal reactions - BPSU study (Arch Dis Child 2002 - MacDougal)
- 8 deaths in under 16s in UK in 10 years (incidence 0.006 per 100,000 children/ year)
- Age and causes of death
 - 3 m, 5y, 9y, 13y, 13y, 13y, 15y, 15y
 - 4 milk, 2 peanut, 1 egg and 1 mixed food
 - Coexisting asthma strong assoc with severe reaction
 - 1 other death from adrenaline overdose

Peanuts

- Isle of White study -2002
 - 1% reported peanut allergy – 2 fold increase in 6 years
 - 3.3% sensitised (positive SPT). 1.5% peanut allergic
- FH atopy, allergy to egg and eczema were predictors of peanut allergy
- Previously thought to be lifelong, now evidence 25-30% of young presenters will outgrow by age 5y
- Some become allergic to other nuts, also legumes

Cow's milk protein allergy/intolerance

- Allergy - immediate allergic symptoms when cow's milk introduced. Spills of milk cause urticaria on skin. Can occur in breast fed
 - Nearly always atopic
 - SPT positive in all
- Intolerance - delayed symptoms -diarrhoea, worsening eczema, wheeze, poor wt gain, irritable
 - Many are atopic
 - Medium (45mins- 20hours) SPT pos 30%
 - Late (greater than 20 hours) SPT pos 16%

Cow's milk protein allergy/intolerance

- 50% grow out of it by 2 years and 80% by 5 years
- Often will tolerate processed cow's milk first - eg in biscuits, yogs, cheese
- Intolerance - often symptoms volume related (many adults can't tolerate large amounts of cow's milk)

Cow's milk free diet

- First line - extensively hydrolysed formula
eg Nutramigen - foul taste
- Soya not recommended (esp in under 6m)
because
 - Risk of soya allergy
 - ?increased risk of peanut allergy
 - ?long term effects of phytoestrogens
- Elemental formula – Neocate for severe cases

Egg allergy

- Prevalence approx 2% - mainly young children
- 80% grow out of it by 4 -6yr
- Increased risk with atopy
- Immediate most common - can be delayed
- Predictor of peanut allergy
- Raw egg and egg white most allergenic - many will tolerate egg within cake etc
- No contraindication to MMR, severe reactions have MMR in hospital

Other allergies

- Oral allergy syndrome - variety of raw stoned fruits can cause intense oral symptoms, and sometimes other systemic
 - Assoc with silver birch pollen allergy
- Latex allergy
 - Children with spina bifida, and others with repeated mucosal contact with latex
 - Assoc with banana allergy and kiwi

Is it a food allergy?

- Pointers in the history to food allergic reaction
 - Timing – usually immediately or soon after ingestion
 - Duration – usually gets better over a period of a few hours
 - Oral symptoms –(seen in allergies to plant matter)
 - Occurs regularly when child has the food (although severity of reaction can vary)
 - Vast majority of children with food allergies are atopic

Identification of allergen

- History, history, history
- RAST - specific IgE, about 85% sensitive, but low specificity, grade 5-6 more specific
- Skin Prick Tests - similar to RAST
 - Peanut naïve atopic children - SPT >5mm - sensitivity 100%, specificity 12.5% (50% children with pos SPT - OK on challenge)
- Food challenges - double blind placebo controlled - gold standard - difficult to do
 - Risk of inducing anaphylaxis

Food challenges

- Not done - if child is at risk of having a severe reaction
- Indications
 - to confirm child has outgrown milk, egg, nut allergy - when SPT and RAST are negative or low (if no recent reaction < 2 years)
 - to confirm diagnosis when SPT and RAST results do not support clinical history - but not if recent severe reaction
 - as above but with severe reaction if last reaction > 2 years ago and repeated RAST and SPTs are negative
- Must not be done without full paed resusc backup
- Child must be well and off antihistamines
- Children with mild egg and milk allergy can be challenged at home

The Adrenaline Controversy

- Case series (Bock 1992) showed fatal cases, had not received adrenaline within first 30 mins and majority occurred in public places, compared to non-fatal. 12/13 had asthma
- Difficult to predict severity of future reactions
- Autoinjectors very easy to use, many children being given them
- BPSU study - very few deaths (1 per 800,000 children with allergy per year) and not many severe reactions. 1 death from adrenaline overdose
- In UK provision of adrenaline varies enormously

Auto-injector provision in Oxford

- All children with previous life-threatening allergic reaction, or significant reaction with breathing difficulties or cardiovascular compromise
- Children with asthma (requiring prophylaxis) and food allergy
- Consider in children who have generalised reaction to minimal skin contact with allergen
- Parents must be trained, given trainer pen, action plan and written information

Which autoinjector should be prescribed?

- A device that is only used infrequently and at a time when child is acutely, severely unwell – needs to be simple, work and there should be no confusion
- Each child should only have one device type
- Probably each school should only have one device type
- I think EpiPen is better device
- Problems
 - public health policy makers not aware of issues at the clinical coal face
 - Drug reps offering special offers without informing of potential clinical impact

Auto-injectors

- Risk – cardiac arrhythmias if given IV - unlikely
- Should only be given to named child
- Should be accessible – on child from senior school age, one centrally as well
- Kept in date
- Mechanism for giving has changed – ‘swing and jab’
- Most children need 3 or 4

Emergency management out of hospital

- Mild/ moderate reactions antihistamine and observe
- Severe reaction - salbutamol if wheezy, EpiPen (0.3mg for >30kg, 0.15mg <30kg)
- Second EpiPen can be given 10mins later – if no response to first, or improves and then deteriorates
- Call 999 - if child given adrenaline must be seen in hospital
- Action plan carried with EpiPen

Allergen avoidance

- Education of children and all carers on reading food labels, and undisclosed ingredients. Now also problem defensive labelling
- Exposure to allergens in other sources – bird food, collage materials, science
- Classic times for mistakes - parties, eating out, holidays, school trips
- Dietetic advice - some parents go for very restrictive diet and become obsessive
- Wasp/bee sting. Latex

Other management

- Encourage families to lead a normal life
- Advice about policy in schools/nurseries, and inform school health nurse, who will train staff
- Medicalert - probably from senior school age
- Encourage children to carry EpiPen on them from senior school age
- Anaphylaxis Campaign - parent support group info

Indications for referral to the allergy clinic

- Life threatening or severe reactions
- Allergic reactions in asthmatic child
- Any child with nut allergy
- Allergen unknown
- Complex/multiple allergies
- Any child with adrenaline

- mild/mod reactions to egg/milk

Allergy clinic

- Wait currently approx 11 weeks, urgent within 4 weeks. Allergy nurse can make contact sooner for urgent cases
- Children not usually reviewed regularly – but severe/complex cases, and very young ones are reviewed. Now recommending can review others at 4-5, and then 10 and 15yr – if uncertainty about still allergic or not

Children with severe eczema

- Dermatologists will consider dietary restrictions (milk and egg) only if not responding to standard treatment
- Should be done with a dietician and carefully monitored
- If immediate type 1 hypersensitivity reaction - referral to allergy clinic

Developments in prevention

Prevention

- Control environment in genetically predisposed
 - breast feeding, exclusive for 4m
 - no solids until 4m, preferably 6m
 - maternal diet – no evidence, but high risk advised to avoid peanuts when pregnant
 - EHF for high risk (first degree relative atopic) if BF not possible
 - ? Pro-biotics

Developments in therapy

In established disease

- safer and more effective immunotherapy (desensitisation currently used for venom, pollen, penicillin -- risk of anaphylaxis) – sublingual now being used for pollen
- More effective mast cell inhibitors
- Recombinant anti-IgE antibody
- Genetically modified food

Conclusions

- Allergy is common in children and increasing. Severe/fatal reactions are rare
- Diagnosis - careful history, supported by SPT and RAST
- Management - allergen avoidance, antihistamine and Epipen (for those with asthma and/or severe reactions) with training
- Future developments -some hope for prevention and treatment