Hypersensitivity

- No link between a specific food allergy, and risk in sibling in that same food.

defined as

- Objectively reproducible symptoms on exposure to a defined trigger.

Disclaimer:
Read the disclaimer at medimaps.co.uk/disclaimer

References:
1. Allergy UK, Birmingham, July 2017
2. Walsall Manor Hosp paediatrician allergy consultant
3. Walsall Manor Hosp dermatology consultant
4. allergyeducation.co.uk
5. Anaphylaxis Canada, Living confidently with food allergy
6. Walsall allergy clinicians Oct 2017
7. Dr Imogen Norton, Webinars for GP's, July 2016.
8. Paediatric allergy conference, Birmingham Oct 2018
9. Dr Helen Howells PULSE conference Sept 2020

if due to immune system malfunction

allergic responce can be classified using Coombs classification

Type	Mechanism	Manifestations	Mediators
I	Immediate hypersensitivty	Urticaria, angioedema, rhinitis, anaphylaxis	IgE
II	Antibody dependent	Autoimmune haemolytic anaemia, thrombocytopenia	IgG, IgM
III	Immune complex deposition	Vasculitis, nephritis, SLE	IgG
IV	Delayed type hypersensitivity	Contact dermatitis	T cells

Allergic

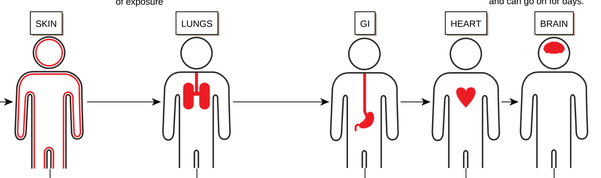
- Increased sensitivity to allergen resulting in an abnormal immune response.
- Often the allergen is a protein.
- On 1st exposure get sensitisation.
- Then on the 2nd reaction will be more severe reaction.
- A singe adverse reaction = 50% PPV of identifying allergy.
- 50-90%of preseumed food allergies are not.

typically occurs within 2 hrs of exposure

IgE mediated

- Typically occurs within 2 hrs of exposure.
- Food.
- Aeroallergen (non-food).

Symptoms



- Itchy mouth.
- Urticaria around mouth.
- Swelling around mouth.

- Oral allergy syndrome
- Local reaction to food in and around the mouth.
- No systemic features.
- Occurs immediately after eating food.

due to

- Fruits.
- Vegetables.

Management

- Not dangerous.
- Multiple options:
- Stop eating trigger food.
OR
- Continue to eat and tolerate symptoms.
OR
- Cook the food.

- Urticaria
- Pruritus
- Erythema
- Angioedema

- A swelling similar to urticaria except that the swelling is beneath the skin rather than on the surface, most commonly in the lips and face, and around the eyes.

- Cough (commonly missed in children)
- Wheeze
- SOB
- Chest tightness
- Nasal itching
- Sneezing
- Rhinorrhoea or congestion +/-conjunctivitis

- Nausea
- Vomiting
- Diarrhoea
- Colicky abdominal pain
- Oral pruritus

- Dizzy
- Pale/blue
- LOC

- Anxiety
- Impending doom
- Headache

Investigations

single most important aspect in diagnosis is

- Allergy focused Hx

- Suspected allergen, and how much causes reaction
- Hx of atopic disease (asthma, eczema or allergic rhinitis)
- FHx (1st degree) atopic disease (asthma, eczema or allergic rhinitis) or food allergy
- Any foods avoided, and why
- Symptoms (age at first onset, speed on onset, duration, severity, frequency, always reproducible on repeated exposure)
- Cultural and religious factors that affect the child's diet
- Age of weaning
- Breastfed (consider the mother's diet)
- Previous treatment and response
- Previous elimination and reintroduction and response

two options to test for IgE mediated allergy

Skin prick test (SPT)

- Make sure not taking oral antihistamine 5/7 before SPT, otherwise get false negatives.
- Can test unusual allergens if suspected.
- Only test for the suspected allergens, not a random batch.
- i.e. Never perform speculative testing.
- Never test for foods their eating with no allergic reaction.
- Immediate results.
- Positive SPT is ≥ 4mm.
- Do not perform if significant eczema, because the false positive rate is very high. Because they are atopic and have lots of antibodies floating around in their blood. It does not mean they are allergic to all those postive results.
- Be aware of sensitisation.

If < 16 y:
- Refer to paediatric nurse led SPT clinic.

If ≥ 16 y:
- Pathology lab offer skin prick allergy testing for routine allergens (food, inhalants etc).

Blood IgE

- Useful if suffer with eczema, clear Hx of type 1 allergic response, or if cant come off antihistamine for 5/7.
- Not affected by antihistamine.
- Only test for the suspected allergens, not a random batch i.e. never perform speculative testing.
- Never test for foods their eating with no allergic reaction.
- Do not do nut mix if only thought to be allergic to one nut, as there might not be enough of that particular nut in the mix, to bring out a postive test. Better to do peanut only. Again Hx helps to choose the specific tests.
- Also test total IgE. If this comes back very high (e.g. due to eczema), then a grade 4 reaction is less significant.
- Be aware of sensitisation.
- Do not use back of hand in kids. Can use ACF. 1ml of blood can test 10 allergens. In fact you can use heel prick or finger prick ! Use blue or orange butterfly with syringe. Using vacutainer < 12 y not recommended as too strong suction.

- Results are expressed from grade 0 to 6 (most positive).
- But grade 6 doesnt mean more severe reaction.
- A result > 0.35 KUA/L is considered postive.
- Grades 0 - 3 = usually not significant.
- Grades 4 - 6 = are usually significant.

Sensitisation

- If thers is evidence of immune activity to specific allergens i.e. positive SPT or positive IgE test, but no clinical reaction on exposure they are sensitised, not allergic.
- So they have a little bit of antibodies in the blood which is enough to give a 'positive' result, but not enough to cause an allergic clinical response.
- So even if positive, do not stop the 'supposed' allergen e.g. do not stop eating peanuts, or get rid of the cat etc.
- Allergy tests are not good at distiguishing between allergy and sensitisation. Hence, the importance of correlating Hx to test results.

Management

Allergy avoidance

- Food allergies → Food Standards Agency booklet on ' Advice on food allergy labelling'.
- Airbourne allergies → Avoid outdoors after midday, windy days, after thrunder storms. Shower on arriving home.
- House dust mite → Hypoallergenic covers on bedding. Replace carpets with wood floor. Steam cleaning, damp dusting. Wash soft toys at 60o and/or freeze 12 hrs.
- Pets → Do not get new pets. If already pets, consider removing. If nto restrict to limited areas, clean surfaces regularly, good air filters.

The key to successful management is:
- Avoidance of affending allergen(s) (see left)
- And carry required treatment wherever the child goes (depends on severity, see below).

Mild - Moderate

- Urticarial rash.
- Swollen lips, face, eyes (angioedema).
- Tingling lips and mouth.
- Abdominal pain.
- Nausea, vomiting.

- Antihistamine e.g. cetirizine / loratadine etc.
- If fails, use fexofenadine.
- Do not use Piriton if school age due to s/e.
- Avamys nasal steroid spray if needed.

- Acrivastine capsule opened up and taken immediately.
- Is fastest acting antihistamine.

Refer to allergy service if indicated. — note →

- If 1 episode of urticaria with no obvious trigger, don't refer.
- It's probably viral.
- They cannot test in allergy clinic.
- Advice them to keep a diary and take pictures.
- Only refer if it's a recurrent problem.

e.g.

- Failure of food elimination.
- Diagnostic uncertainty.
- Anaphylaxis or acute systemic reaction.
- Issued Epipen.
- Management plans.
- Avoidance advice.
- Ongoing parental concerns.
- Failure to thrive.
- Failure to control symptoms.
- IgE food allergy and also asthmatic.
- Eczema and suspected multiple food allergy.
- Suspect IgE allergy but negative test.
- Multiple food allergies.
- Multisystem allergic disease.
- (note: refer to ENT if persistent and failure of treatment for rhinoconunctivits).

- May consider immunotherapy i.e. desensitization.

Indications:
- IgE-mediated.
- Positive serum IgE / SPT.
- Inability to avoid allergen.
- Inadequacy of drug treatment.
- Limited spectrum of allergies.
- Patients who understand risks and limitations of treatment.

Contra-indications:
- Co-existent uncontrolled asthma.
- Patients taking beta blockers.
- Patients with other medical/immunological disease.
- < 5 y age.
- Pregnancy.
- Patients unable to comply with the immunotherapy protocol.

Severe

Airway:
- Persistent cough
- Change of voice
- Difficulties with swallowing
- Swollen tongue

Breathing:
- Difficulty
- Noisy breathing
- Wheeze
- Persistent cough

Consciousness:
- Dizziness
- Pale
- Floppy
- Collapse

i.e.

ANAPHYLAXIS

What is it?

- Anaphylaxis is a life threatening reaction (30 deaths per year).
- IgE mediated.
- Mast cells burst. Mast cells are located all over the body, hence the multisytem reaction.
- If swelling in front of the teeth not too worrying. If behind teeth, more worrying.
- If swelling and not itchy doesnt need adrenaline.
- If any difficulty breathing or swallowing, just go ahead and give the epipen.
- Usually you will know you have eaten wrong food, and you will get hives.
- No harm if given when not actually needed. But could die if not given, when it was needed.

- Epipen/Jext
AND
- Antihistamine
AND
- Refer

- Acrivastine capsule opened up and taken immediately.
- Is fastest acting antihistamine.

- Childre, re-refer when 5y old to test for resolution.

Indications

Give Epipen/Jext if:
- Severe allergic reaction to food. → Swelling of the tongue or throat. Difficulty swallowing. Wheezing. Difficulty breathing. Coughing. Pale and clammy. Blue lips. Drowsy. Dizzy. LOC.
- Asthma and high risk food allerged e.g. nuts.
- Reaction to trace amounts of allergen.
- Exercise induced anaphylaxis.
- Idiopathic anaphylaxis.
- Severe allergic reactions to insects.
- Mast cell disorders.
- Live in isolated community e.g. rural area.

- Do not give Epipen/Jext if:
- Easily avoidable allergy e.g. drugs, shellfish, kiwi.
- Even nut allergy does not need an Epipen per se.
- Unless meet indications listed.

MOA

- Vasoconstriciton hence ↑ BP.
- Dilates airways.
- ↓ mucosal oedema.
- Prevents mast cells releasing more chemicals.

Dose

Epipen:
- 7.5-25kg = 0.15mg
- > 25kg = 0.3mg

Jext:
- 15-30kg = 0.15mg
- >30kg = 0.3mg

Number of Epipens

- Latest NICE guidance states should have 2 Epipens/Jext.
- Depending on childs age and competence they should be carrying the 2 pens with them at all times.
- Some schools (usually primary) lock away the pens to avoid the situation of child forgetting to bring them into school in the morning.

- Previous guidance:
- For most people 2 Epipens/Jext are not necessary.
- For school children the BSACI says can have one for home, and one for school.
- Only other reasons to get 2 pens are:
- Previous life threatening reaction.
- Previously required 2 doses in a short period.
- Obesity.
- Live in isolated community e.g. rural area.

Risks

- Innapropriate epipen prescribing can cause:
- Risk taking behaviour.
- Burden of carrying.
- Source of anxiety.
- Limits jobs.

Counselling

- Direct to Allergy UK and Anaphylaxis campaign website.
- Medical alert bracelet.
- Issue written management plans from BASCI website.
- Parents and pt to familiarise themselves with the anaphylaxis plan on a regular basis.
- Tell school/ work. They need training.
- Highest risk when go to 2o school, school trips, parties.
- Know when to inject.
- Demonstrate how to use.
- Lie flat and raise legs to ensure don't end up with empty ventricle syndrome which would stop CPR from working if it was needed.
- Once given, have to ring 999 and go to A&E STAT to prevent the possibility of a delayed reaction occuring with no access to adrenaline.
- Use 3/7 of steroids after epipen use.
*** But avoidance is key ***

Prognosis

- Can grow out fo the allergy.
- Milk = 90% of pt's the allergy resolves.
- Eggs = 95%.
- Peanuts = 20%.

???refer all IgE to dietician???

if not due to immune system malfunction

Non-allergic OR Food intolerance

- Ketchup → Likely some local chemical irritation around the mouth. Its almost a contact dermatitis.
- Undefined sulphites
- Salycilates
- Lactose intolerance
  - This is a food intolerance.
  - Your missing an enzyme and so a food doesnt agee with you.
  - Another example is not being able to tolerate alcohol.
  - These intolerances are different to allergies, which are Ig mediated. → Usually starts at 2y age. Explosive diarrhoea. Cramping, Bloating. Wind. Irritability.
  - Four types:
  - 1o resulting of ageing.
  - 2o due to illness or injury.
  - Congential due to abscence of lactase.
  - Developmental due to prematurity.

Investigations

- No test available.
- Do not test reducing substances.
- IgE and SPT are useless.

Management

- Could try lactose free formula for 2/52 (buy OTC).
- Colief trial.
- Can refer to dietician if not sure.

typically occurs many hrs after exposure, and can go on for days.

Non IgE mediated

- Typically occurs many hrs after exposure, and can go on for days.

Symptoms

- Vomiting
- Diarrhoea
- Lethargic
- Colic
- Dehyrated
- PR blood/mucus
- Food refusal
- Perianal redness
- Faltering growth

one subtype includes

- Food protein induced enterocolitis syndrome (FPIES)
- Food allergy affecting the GI tract.
- Often initially misdiagnosed as an infection, due to similar clinical picture.

most commonly due to

- Rice
- Ooats
- Milk
- Soy
- Barley
- Peas
- Sweet potatoes
- Poultry
- Squash

Management → Refer to 2o care urgently.

Investigations

single most important aspect in diagnosis is → Allergy focused Hx → No test available. IgE and SPT are useless. Specialist centres refuse to test.

Management

- If no type I symptoms (i.e. IgE mediated) then tests are not helpful.
- Worsening of eczema with food is non IgE mediated. Treat the eczema. Explain its like asthma which can flare up for no apparent reason. → Dermatology only undertake allergy testing for suspected allergic contact dermatitis (type IV allergy). They do not offer food allergy testing or see patients with type I allergic reactions. Do not offer allergy testing for children with eczema.

- Not dangerous. Cannot lead to anaphylaxis.
- Trial of eliminating food from diet for 4-6/52 (takes that long for them to be able to do this properly as allergens can be in lots of foods).
- Take out one thing only at a time or else will not know what the allergen is.
- Reintroduce to confirm allergy. Should get symptoms again. Diagnosis confirmed.
- If unsure, refer to paediatric dietician.
- Many will grow out of it, but cant say when to reintroduce.

Refer to paediatric (<16 y) allergy clinic if required

- Diagnostic uncertainty
- Failure to thrive
- Failure of control
- Severe reaction
- Significant eczema and suspected food allergy
- Multiple food allergies