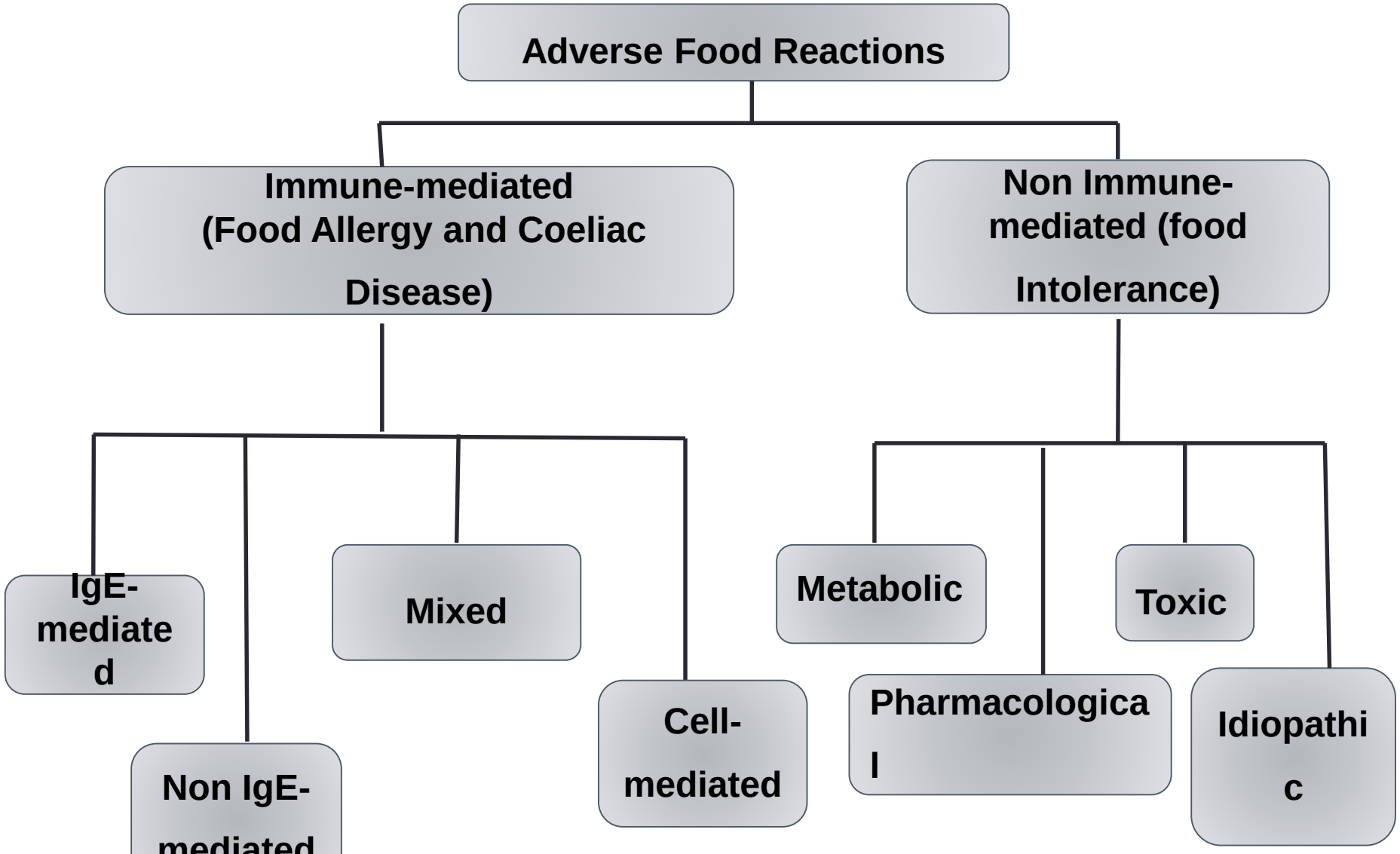
# Intolerance to food additives and natural food components – what is the evidence?

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Adapted from:
Guidelines for the Diagnosis and Management of Food Allergy in the United States (Boyce et al 2010)

# Does Food Intolerance Exist?

- Physicians exclude allergy and structural diseases by blood testing, allergy tests and endoscopy
- Food intolerance is often not considered as there is no validated test – there needs to be a dietary approach!
- These patients often have seen multiple specialists, have uncertainties about the right diet, still experience recurrent postprandial complaints, and have reduced quality of life

# FOOD ADDITIVES AND NATURAL CHEMICALS

# Natural Food Colourings

- **Cochineal** (E120) or carmine – manufactured using the female insect *Dactylopius coccus*
- Commercial carmine retains insect derived proteins which can cause IgE-mediated food allergy
- **Annatto** (E160b) - extracted from the seeds of *Bixa Orellana,* present in cheese, margarine, butter, smoked fish
- case report of a severe reaction to Gouda cheese precipitated by Annatto (Ebo et al Allergy 2009)
- **Turmeric** (E100) - extracted from *Curcurma longa*, (ginger family), present in curry powder, mustard and other foods
- Curcumin, the active ingredient in tumeric, has been reported to cause contact dermatitis

# Artificial food colourings

- Azo dyes - tartrazine (E102), Quinoline yellow (E104), Sunset Yellow (E110), Azorubine or Carmoisine (E122), Amaranth (E123), Ponceau 4R (E124) and Allura red (E129)
- 60-70% of all dyes used in food and textile manufacture
- **Tartrazine** – linked to asthma but poor evidence (Juhlin et al 1972, Nettis et al 2003)
- A diet free of additives could help in the treatment or prevention of hyperactivity in children (Feingold 1975)
- Mix of sodium benzoate and food colourings including tartrazine shown to increase hyperactivity in some children (McCann et al 2007)

# Food Preservatives

- **Sulphites (E220-227)**
- Control browning, reduce microbial spoilage, bleaching agent, control black spot in shrimps
- Added either as a free form mix of sulphur dioxide, bisulphite and sulphite, or bound to carbohydrates or proteins
- Foods containing a high level of free form sulphite are more likely to provoke a reaction and this dictates how much sulphite can be added
- EU Maximum Permitted Level (MPL) - expressed in mg/kg or mg/l of sulphur dioxide (EU Directive 95/2/EC)
- MPL of dried fruit 600-2000mg/kg, wine 200mg/litre and horseradish pulp 800mg/kg

# How much is in our food?

- Acceptable Daily Intake (ADI) 0.7mg/kg:
- 56mg for 80kg male
- 42mg for 60kg female

FAO/WHO Expert Committee on Food Additives 1974)

- Typical daily intake 54.5mg including 20.2mg from wine (Manzi et al 1992)
- Up to 123mg/day could be consumed by adults - wine and dried fruit principal sources (Leclercq et al 2000)

5 dried apricots = 80mg sulphite





300mls cider = 57mg sulphite

Beef burger & frozen chips = 61mg sulphite



[Simon 1998, Verger et al 1998, Cummings et al 1999, Leclercq et al 2000, Vally 2012, Zhang et al 2014]

| MPL | Fruit ,Vegetables & nuts | Sulphite (mg) |
|---|---|---|
| 2000 | 5 dried apricots (40g) | 80 |
| 2000 | 1 tablespoon sultanas (30g) | 60 |
| 2000 | 3 prunes (30g) | 60 |
| 2001 | 1 fig (20g) | 40 |
| 1000 | 10 slices dried banana (13g) | 25 |
| 1000 | 1 tbsp candied/crystallised/glace fruit (25g) | 25 |
| 100 | 1 portion frozen chips/potatoes (165g) | 16.5 |
| 500 | 5 chestnuts (50g) | 25 |
| 351 | 1/2 pint of cider (284mls) | 56.8 |
| 50 | 1 pint real ale (568mls) | 28.4 |
| 210 | 1 medium glass white or rose wine 125mls) | 26.2 |
| 160 | 1 medium glass red wine (125mls) | 20.0 |
| 162 | Fruit squash/cordial (50mls) | 12.5 |
| 164 | 1 average glass grape juice (160mg) | 11.0 |
| 450 | 1 meat burger (less than 100% meat) | 45 |
| 300 | 1 small jar shrimps (100g) | 30 |
| 200 | 1 portion dried salted fish (120g) | 24 |
| 200 | 1 Quorn fillet (100g) | 20 |
| 150 | Fresh or frozen cooked lobster (85g) | 12.7 |
| 800 | 1 sachet horseradish sauce (12g) | 9.6 |

# Does sensitivity to sulphites really exist?

- 250 cases of sulphite-related adverse effects in the USA in the 1980s (Yang and Purchase 1985)
- Predominant symptom is bronchoconstriction but has also caused anaphylaxis (Jamieson et al 1985)
- May affect up to 5% of asthmatics - range 3.9% to 8.4% if steroid-dependant (Buckley et al. 1985, Bush et al. 1986)
- This is why it is the only food additive that has to be declared - Sulphur dioxide and sulphites at concentrations of more than 10mg/kg or 10mg/litre

# Wine reaction = sulphite sensitivity?

- Level in wine <10mg/kg to 198mg/kg (Leclerq et al 2000)
- Added to control mildew in grapes and oxidation in the wine
- Champagne bottle fermented so less added sulphite
- Survey of 366 adult asthmatic subjects showed 33% reported reactions to alcohol (Vally et al 2000)
- Study using high and low sulphite wines found no major role for sulphite additives in wine-induced asthmatic responses (Vally et al 2007)
- 43% subjects reporting reaction to white wine had positive DBPCFC to sodium metabisulphite capsules (Skypala et al unpublished)

# Is asthma the only condition involved?

- Sulphites can cause urticaria and angio-oedema both through topical and/or ingested sulphite (Vally et al 2009)
- About 4% of contact dermatitis due to occupational exposure to sodium metabisulphite, but these patients can also have systemic symptoms (Madan et al 2007, Garcia Galvin et al 2012)
- Sulphites can non-specifically activate mast cells, releasing small amounts of histamine which can cause gut symptoms and soft stools
- In Korea 2 phenotypes of sulphite sensitivity reported:

  66% - sulphite sensitive asthma

  33% sulphite-sensitive urticaria (Ban et al 2014)

# Benzoates (E210-219)

- Used to retard the growth of bacteria
- Sodium benzoate (E211) is typically added to beer, jam, fruit products, pickled foods, yoghurt and salad cream
- Also occur naturally, in the form of free acid or salts, in foods such as cinnamon, cloves, tea, prunes and berries such as raspberry and cranberry
- Parabens - esters of para-hydroxybenzoic acid - are used as antimicrobial agents in cosmetics and drugs but have also been used in foods including fruit juices, pickles, sauces and soft drinks

# Benzoates

- Allergic dermatitis - DBPCFC to a mixture of food additives including benzoates was negative (Wuthrich 1998, Van Bever and Stevens 1989, Park et al 2008)
- Asthma - only 2-4% of patients with asthma reacted on challenge and this was not reproducible on re-testing or on dietary exclusion (Weber et al 1979, Tarlo et al. 1981)
- Perennial rhinitis - 9% of subjects reacted on DBPCFC and an improvement on an additive-free diet (Pacor et al. 2004 )
- Urticaria - 0.7-2% of those with chronic urticaria and angiooedema are reactive to sodium benzoate (Ortalani 1984, Nettis 2004, Di Lorenzo 2005)
- Oro-facial granulomatosis (a rare chronic granulomatous inflammatory disease of the lips, face and mouth) - 54-78% with this condition improved on a cinnamon and benzoate-free diet (White 2006, Campbell 2011)

# Monosodium Glutamate (E621)

- Intake of MSG ranges from 0.5g in the USA to 1.6g in Korea
- ⅓ of intake comes from added MSG
- Ripening of fruits e.g. tomatoes and curing of meat increases free amino acids such as glutamate
- Most commonly reported symptom is pressure headache, paraesthesia, neuralgic-like pain in the neck and chest.
- More research needed before establishing cause and effect between MSG and migraine (Obayashi and Nagamura 2016)
- 2/130 responded to a large dose given without food, with no responses noted when MSG was given with food (Geha et al 2000)

# Sources of MSG

Naturally found in:

- Fish Sauce, Parmesan cheese, mushrooms, spinach, soy sauce, miso

Added to:

- savoury snacks, crisps, soups, stock, gravy, rubs, coatings, ready-meals, black bean sauce, oyster sauce, tomato sauce, marmite (Skypala et al 2014)

# Biogenic or vaso-active amines

- Vasoactive amines are produced during fermentation or during storage or decay (Jansen 2003)
- Histamine, beta-phenylethylamine, tyramine, tryptamine, putrescine, cadaverine, spermine and spermidine
- Levels can vary between different foods and within food varieties (Bodmer et al 1999)
- Quantity determined by the type of bacteria, food composition and conditions for fermentation (Yang 2014)

## Fish

Fresh – 2.6mg/kg  Canned – 3.1mg/kg

Frozen– 5.8mg/kg  Dried - 104mg/kg

Yesudhason et al 2013



## Sea Bass

Visciano et al 2012

Fresh – 0.0mg/kg

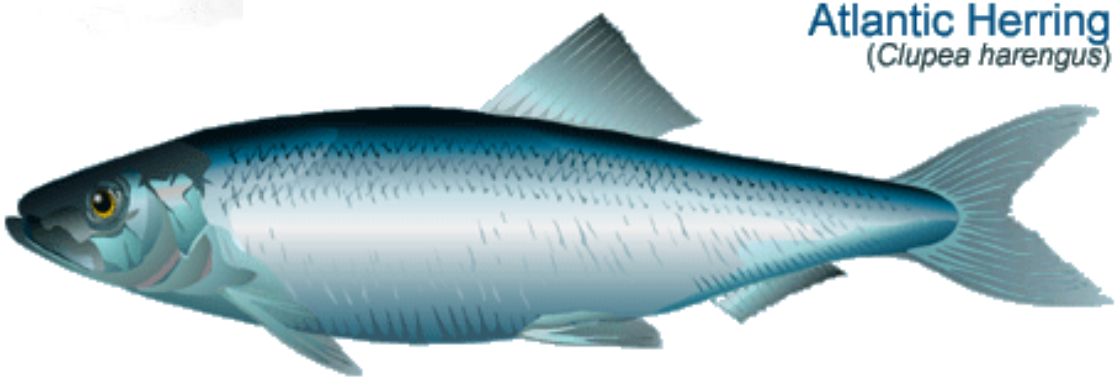
16 days old – 0.0mg/kg

## Herring

Visciano et al 2012

Fresh – 0.0mg/kg

16 days old – 271mg/kg




Tuna -Fresh/Canned – 0.2/0.4mg/kg  Visciano et al 2012

Tuna – Unspecified - 2,967mg/kg  Choi 2007

## Gouda



Histamine
900mg/kg

Tyramine
900mg/kg

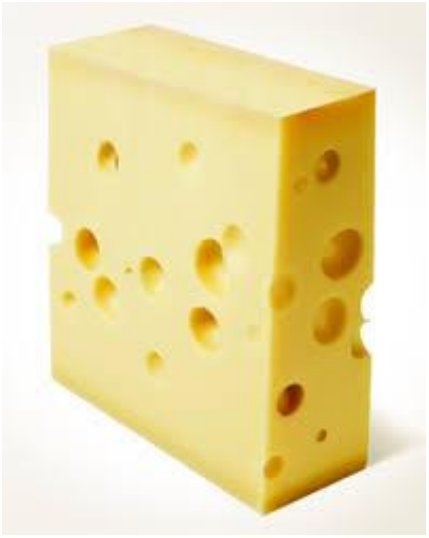
## Camembert



Histamine
1000mg/kg

Tyramine
4000mg/kg

## Emmenthal



Histamine
2500mg/kg

Tyramine
700mg/kg

Maintz and Novak 2007

- Normal plasma histamine concentrations 0.3 and 1.0ng/mL
- 1-2 ng/mL -increased gastric acid secretion and heart rate
- 3-5ng/mL - flushing, headache, urticaria, pruritus, tachycardia
- 7-12ng/mL - bronchospasm
- 100ng/mL – cardiac arrest (Maintz and Novak 2007)

Scombroid poisoning –bacterial conversion of histidine, present in fish tissue, to histamine. At room temperature, the histamine concentration rapidly increases, reaching toxic concentrations within 12 hours





# Histamine Intolerance

- **Repeated postprandial symptoms**:
- migraine and headache
- cutaneous reactions (erythema, pruritus, flush, or urticaria)
- gastrointestinal symptoms (nausea, vomiting, flatulence, colic, or diarrhoea)
- respiratory complaints (nasal obstruction, rhinorrhoea, asthma)
- cardio circulatory complications (arrhythmia).
- other - fatigue and dysmenorrhea

**Mechanism:**

- A reduction, inhibition or deficiency of the enzyme di-amine oxidase which degrades histamine and putrescene

Other factors may include:

- Histamine release from mast cells and basophils
- Bacterial production of histamine within the gut
- The amine content of ingested foodstuffs influencing the histamine concentrations in blood, tissues and gut.

- Suggested 1% of the population might be affected - 80% of whom will be middle-aged (Missbuchler 2004)
- 10 healthy volunteers challenged on two consecutive days with 75mg histamine - 50% experienced immediate as well as delayed symptoms including GI symptoms (Wöhrl et al 2004)
- 39 patients reacted to 75mg liquid histamine although single symptoms were not reproducible in a placebo-controlled challenges (Komericki et al 2011)
- Reactions dose dependant - 36-250mg histamine (Malone et al 1986)
- Reactions to amounts as low as 2.5mg have been reported (Morrow et al 1991)
- Nonspecific abdominal symptoms often misinterpreted as IBS
- 58% of IBS patients reported complaints after ingestion of histamine releasing food items or foods rich in biogenic amines (Smolinska 2013)

# Alcohol inhibits diamine oxidase

- Alcohol contains histamine and Acetaldehyde, a by product of alcohol metabolism, can release histamine

| Alcohol | Amines mg/L | Reference |
|---|---|---|
| Cider | 5.94-8.42 | Garai et al 2006 |
| Red/white wine | 287/162 | Choi et al 2007 |
| Red/white wine | 10/30 | Maintz and Novak 2007 |
| French/Italian/Spanish wine | 3.63/2.19/5.02 | Bodmer et al 1999 |

16 adults underwent double-blind provocation test with two wines
Symptoms in 15 subjects after Wine A and 14 subjects after Wine B
10 minutes after challenge levels plasma histamine higher after wine A than wine B ($p<0.05$) Kanny et al 2001

| Biogenic Amines | Wine A (mg/L) | Wine B (mg/L) |
|---|---|---|
| Histamine | 0.4 | 13.8 |
| Tyramine | 2.4 | 9.0 |
| Putrescine | 12.1 | 61.0 |
| Methylamine | 0.1 | 0.6 |
| Ethylamine | 1.1 | 3.1 |
| Phenyethylamine | 0.6 | 0.9 |
| Isoamylamine | 0.5 | 1.8 |
| Cadaverine | 0.5 | 0.6 |

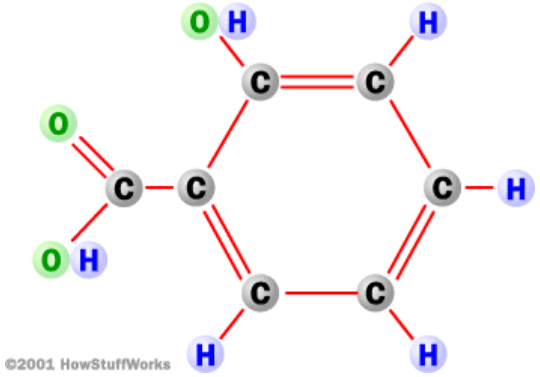
# Capsaicin

- Paprika, chili pepper and spices can cause non-specific gastritis, abdominal pain, diarrhoea or IBS exacerbation after 15-20 minutes
- Capsaicin intolerance causes numbness, paraesthesia, oral burning, flushing, abdominal cramps, or diarrhoea due to the activation of transient potential vanilloid 1 receptors (TRPV1) in the gut
- Single or intermittent capsaicin ingestion has been shown to worsen symptomatology in IBS patients
- Large doses desensitize the TRPV1, and may improve functional symptoms.
- (Esmaillzadeh 2013, Gonlachanvit et al 2009)

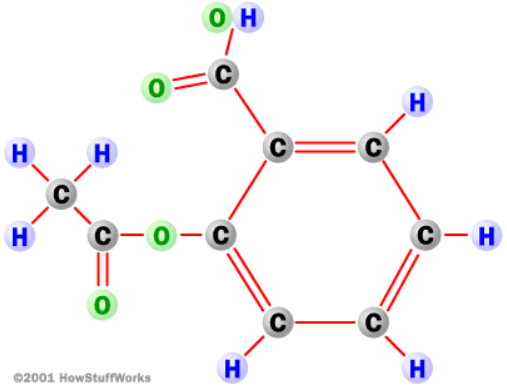
# Salicylates



- 1828 - salicin, the active ingredient in white willow, had a pain relieving effect
- Conversion of salicin to salicylic acid during digestion
- 1853 – salicin extracted, oxidised and hydrolysed to make salicylic acid
- 1899 - acetyl salicylic acid was commercially launched and called aspirin




Salicylic acid




Acetylsalicylic acid

# How does aspirin work?

- The enzyme cyclooxygenase (COX) enables the conversion of arachidonic acid to cyclic prostenoids which are further processed into prostaglandins
- COX inhibition is the primary mechanism of all non-steroidal anti-inflammatory drugs (NSAIDS) including aspirin and ibuprofen
- There are two isoforms of COX, COX-1 and COX-2
- Aspirin is a potent inhibitor of COX-1 and salicylic acid and other NSAIDS such as Ibuprofen inhibit COX-2

# Aspirin Hypersensitivity

- Prevalence 0.6% to 2.5%
- Increases to 4.3-11% in asthmatics
- Aspirin-sensitive asthmatics may also have nasal polyposis
- Non-immunologic systemic disease characterised by Samter and Beers in 1967
- Samter's triad – asthma, aspirin HS and nasal polyps
- Can salicylate in plant foods also provoke a reaction?

# Salicylate intolerance

- Salicylate intolerance ‘a nonspecific antigen-induced pseudo-allergic hypersensitivity reaction to salicylic acid, its derivatives or other related organic or inorganic acids of similar chemical structure’ (Raithel et al 2005)
- 2.5% of Europeans may have some sensitivity to salicylates (Baenkler 2008)
- Intolerance of NSAIDS is effective for 2-7% of those with food allergy and IBS (Raithel et al 2005)
- No evidence of the effect of dietary salicylates on the gut and no published studies demonstrating efficacy of salicylate avoidance in gut disease (Gibson 2011, Barrett and Gibson 2012)
- Other studies reported no effect on lung function during salicylate challenges (Dahlén et al1994)

# Which foods?

- Salicylates are found in a wide variety of plant foods
- Landmark study by Anne Swain in 1985 (Swain et al 1985)
- Other UK and European studies have published very differing figures (Venema et al 1996, Scotter et al 2007, Wood et al 2011)

| Food | Portion size | Salicylic acid mg/kg Scotter/Swain |
|---|---|---|
| Lemon | 20g | 3.2 / 0.18 |
| Currants | 25g | <0.01 / 5.8 |
| Tomato ketchup | 12g | 0.3 / 2.48 |
| Dried Oregano | 3g | 26.0 / 66.0 |
| Mixed Herbs | 3g | 22.3 / 55.6 |
| Curry powder | 3g | 15.2 / 218.0 |
| Coffee | 1 mug | 6.8 / 0.84 |
| Tea | 1 mug | 1.06 / 5.57 |

# DIAGNOSIS

- EAACI Task Force set up in 2012
- Complementary to the EAACI Food Allergy guidelines
- Developed paediatric and adult tools based on expert opinion
- Published February 2015

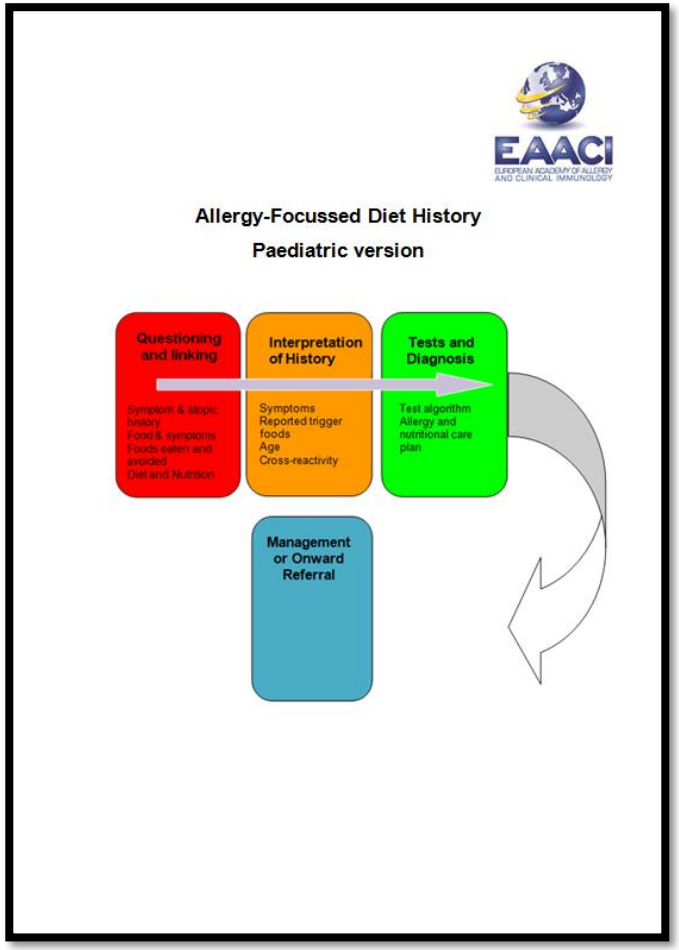
Skypala *et al. Clinical and Translational Allergy*
DOI 10.1186/s13601-015-0050-2

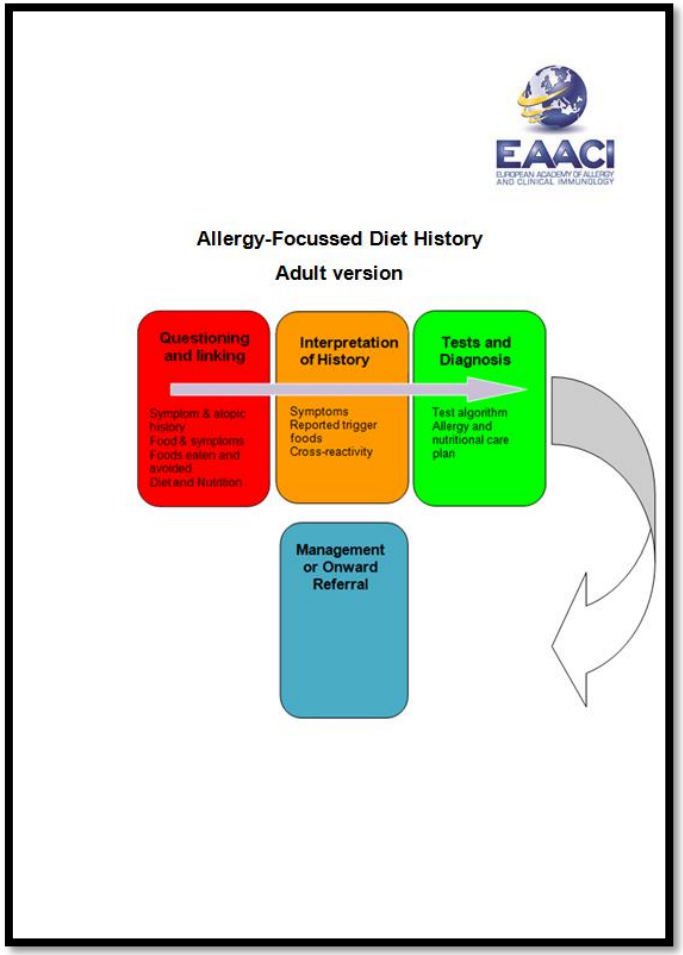
*Clinical and Translational Allergy*

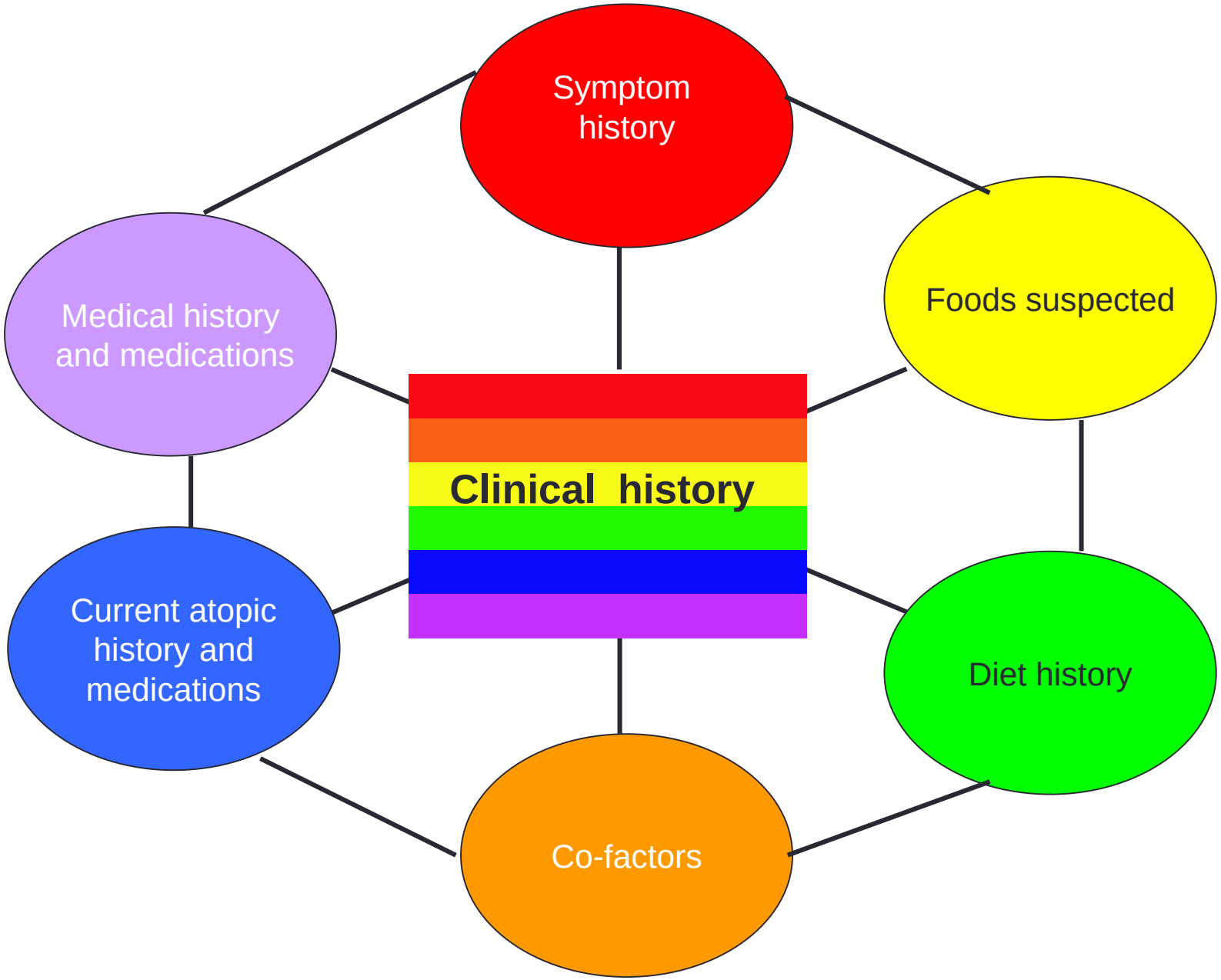
REVIEW Open Access

## The development of a standardised diet history tool to support the diagnosis of food allergy

Isabel J Skypala[1*], Carina Venter[2], Rosan Meyer[3], Nicolette W deJong[4], Adam T Fox[5], Marion Groetch[6], J N Oude Elberink[7], Aline Sprikkelman[8], Louiza Diamandi[9], Berber J Vlieg-Boerstra[10] and the Allergy-focussed Diet History Task Force of the European Academy of Allergy and Clinical Immunology




Symptom history
Foods suspected
Medical history and medications
Clinical history
Current atopic history and medications
Diet history
Co-factors

# Tests

- Allergy (IgE )
- IgG, IgM, IgA (infection, autoimmunity)
- Complement C3, C4, C1 Esterase inhibitor, C1 Esterase functional
- Tissue Transglutaminase
- H2 breath tests for carbohydrate malabsorption or small bowel overgrowth
- Stool cultures to exclude infections (Helicobacter Pylori, Giardiasis), and assess intestinal inflammation (faecal calprotectin)
- Liver and kidney function, inflammatory markers (ESR, CRP)
- Nutritional status – iron, vitamin D, Folate, B12

# Diagnosing sulphite sensitivity

- Due to differing levels of available sulphite in different foods, few trials have used foods when evaluating sulphite sensitivity
- Only 50% subjects with a confirmed sulphite sensitivity responded to a variety of sulphite foods (Taylor et al 1988)
- Diagnostic challenges with encapsulated or solute forms of sodium or potassium metabisulphite are the preferred option (Bush et al 1986, Taylor et al 2003, Ban 2014)
- Dosage of 40mg sulphite precipitated reactions (Vally)
- Challenge dose 20mg and 50mg in capsules precipitated reactions (Skypala et al unpublished)

# Benzoates (E210-219)

- Preserved salted fish 75.4 mg
- Cinnamon - 33.6 mg
- Soft drinks - 14.4 mg
- Ice cream 10.7 mg
- Cranberry 8.9 mg
- Jams 7.1 mg
- Soy sauce 5.1 mg
- Nutmeg 4.41 mg
- Dried apricots 3.04 mg

Campbell et al 2013

# Histamine Intolerance

- Intake of Diamine oxidase capsules compared to placebo led to a statistically significant reduction of total symptom scores ($p = 0.014$) (Komericki et al 2011)
- Low plasma Diamine oxidase levels were a good indicator of response to a low histamine diet (Rosell-Camps et al 2013)
- Wheal size of a histamine SPT greater than 3mm, 50 minutes after test (Kofler et al 2011)

Diagnosis may be considered when >2 typical symptoms of histamine intolerance occur and improvement following a low histamine diet leads to resolution of symptoms with or without concomitant use of antihistamines

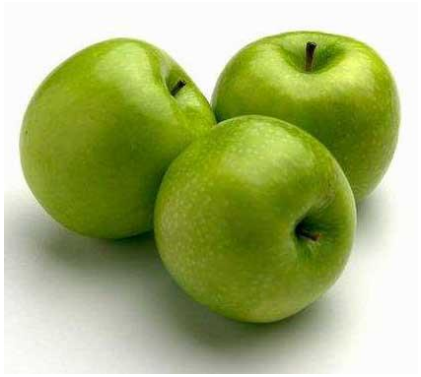
(Raithel et al)

# Elimination of high histamine foods and re-introduction

| |
|---|
| Fresh pork, cured meat e.g. ham, salami, pepperoni, game, bacon, sausages,, Fresh or canned tuna, canned sardines, anchovies, mackerel, salmon, herring, processed fish products (fish pastes, smoked, dried or pickled fish), fish sauce |
| Blue cheese, Parmesan, Brie, Camembert, Emmental, old Gouda, Cheddar cheese |
| Oranges bananas, tangerines, pineapple, grapes, strawberries |
| Tomatoes, pickled cabbage, aubergine, spinach, broad beans, peanuts, tree nuts, |
| Fermented soy products including miso and tempeh |
| Green tea, champagne, coffee, Cocoa, Chocolate, wine, beer, fresh fruit juices, smoothies, |

# Salicylates

- 4 week trial of the avoidance of high salicylate foods and advice on cumulative effects of medium salicylate foods
- Restrict diet to those most likely to gain benefit - salicylates may protect against certain cancers, especially colorectal cancer (Raithel et al 2005)
- Establish tolerance to aspirin and NSAIDS and review current diet and likely levels of salicylate
- Salicylate levels in individual fruit varieties can differ substantially





# Which foods are high?

- Average intake mg/day:

  10-200(Swain et al1985)

  0-5mg (Venema et al 1996)
- One aspirin tablet contains 200-500mg of acetyl salicylate
- 2.6mg of salicylate reported to elicit a 15% decrease in FEV1 in sensitive asthmatics (Corder and Buckley 1995)
- Although some foods are very high in salicylate, when portion size is taken into consideration.....

Mitchell and Skypala 2013

| HIGH | MEDIUM |
|---|---|
| >0.5mg per portion | 0.1-0.5mg per portion |
| Granny Smith apples, cherries, strawberries | Currants, raisins, kiwi, Gala melon, peaches and nectarines, raspberry |
| | Asparagus, sweet corn, raw tomatoes, tomato puree |
| Ginger, mixed herbs, mustard, oregano | Black pepper, cardamom pods, cinnamon, cumin, fenugreek, mint, nutmeg, paprika, rosemary, thyme, turmeric, |
| Coffee, pineapple juice, cider, Benedictine liqueur | Lemon tea, black tea, apple juice, cranberry juice, orange juice, tomato juice, fizzy drinks, Drambui liqueur, wine, rum |
| Liquorice, Peppermint (per 100g) | Worcestershire sauce, Honey, tomato ketchup |

# Multiple food removal – is it effective?

- 140 subjects went on a 3 week pseudoallergen-free diet
- Eliminated all processed food, artificial substances, food additives, dyes, antibiotics, preservatives, phenols, foods naturally rich in aromatic compounds, alcohol, spices and herbs, sweets, eggs, seafood, most fruits and vegetables
- 20 (14%) strong responders and 19 (19%) partial responders

Mageri et al Allergy 2010

- 100 patients challenged to 11 additives (tartrazine (FD&C Yellow 5), potassium metabisulfite, monosodium glutamate, aspartame, sodium benzoate, methyl paraben, butylated hydroxy anisole, butylated hydroxy toluene, FD&C Yellow 6, sodium nitrate, sodium nitrite)
- 2/100 had a positive urticarial response on single-blind challenge not reproducible on DBPCFC
- Sensitivity to any of the 11 food and drug additives occurs in fewer than 1% of patients with CIU

Rajan et al 2014

# Are some foods high risk?

| Food | Amine | Glutamate | Salicylate | Sulphite | Benzoate |
|---|---|---|---|---|---|
| Cheese | ✓ | ✓ | | | |
| Wine | ✓ | | ✓ | ✓ | |
| Soy | ✓ | ✓ | | | ✓ |
| Tomatoes | ✓ | ✓ | ✓ | | ✓ |
| Spinach | ✓ | ✓ | | | ✓ |
| Worcestershire sauce | | ✓ | ✓ | | ✓ |

# Differential diagnosis

- Isolated angioedema – caused by ACE-inhibitors in patients on cardiac/BP/renal medication or more rarely HAE or acquired C1-esterase deficiency secondary to lymphoma
- Chronic spontaneous urticaria +/- angioedema - no clear, reproducible link to specific food
- Mastocytosis –excessive mast cells in one or more tissues, systemic symptoms and a high level of tryptase
- Laryngospasm/Vocal Cord Dysfunction - sensation of throat tightness/obstruction in the absence of other typical allergic symptoms
- Acute and chronic infections (Giardiasis, Helicobacter Pylori)
- Neuroendocrine tumours (can manifest with postprandial flush, tachycardia and elevated histamine or serotonin excretion)
- Psychosomatic reactions and eating disorders,

# Not a real food allergy?

- Additives and natural food components can induce severe symptoms including anaphylaxis
- Careful history to exclude food allergy, a food allergy linked to a co-factor or a differential diagnosis
- Evidence for additives or natural food components in the causation of symptoms is limited but does exist

- Keep an open mind but don't over exclude foods
- Target the dietary intervention to match the symptoms and foods involved
- Placebo effect of dietary intervention has not been measured but probably significant



# CASES

# Sweet tooth

- 26 year old MSc student from Japan
- Ate red velvet cupcake in café
- 30 minutes later developed itching on hands and feet, followed by orbital and facial swelling which took a week to resolve
- Eating eggs, milk, wheat
- Now avoiding all food colourings
- SPT in clinic positive to HDM (15mm) and cochineal (9mm)
- Diagnosis – cochineal allergy
- Other foods involved – coloured icing on cakes and biscuits, colourings added to tandoori baked dishes, commercial milkshakes, jelly, sweets
- Not all red velvet cakes contain cochineal!

# A useful dietary intervention?

- 64 year old female patient
- Flushing, itching, gut symptoms 20 minutes after eating
- Avoids milk and dairy products as thinks lactose intolerance is the cause but still having problems
- Worse after Italian foods (is still eating Parmesan cheese as low in lactose)
- Rash and flushing with alcohol
- Plan – 4 week avoidance of high histamine foods
- Result – feeling much better but diet very restricted
- Advised managing the diet by avoiding eating high histamine foods together as dose relationship
- Advised taking anti-histamine or diamine oxidase replacements if eating out or taking alcohol at home

# Beware the internet

- 54 year old male lecturer
- Dark patches under his eyes and extreme lethargy 24 hours after eating high sulphite foods
- Now avoiding all high sulphite foods including a large variety of fresh, dried and canned fruits and vegetables, nuts, meat, shellfish, eggs, all alcohol and tap water
- List obtained via Google
- Eating milk, fresh fish, chicken, rice, oats, apples, green beans, cucumber
- Has unstable asthma
- Given correct food list and strongly advised to reintroduce foods not on the list
- Advised cannot challenge due to asthma

# Food allergy, food intolerance or ??

- 35 year old works in an office
- Ten year history of oral symptoms, sore mouth, dry mouth, dry lips
- Links these to foods including fizzy drinks, yoghurt, pastries, spicy food, and desserts
- Cut out milk, wheat and nuts; this has not made much difference but reluctant to reintroduce them
- Has lost 3kg in weight
- Given information on benzoates in foods – advised especially to avoid cinnamon, berries and check ice cream and fizzy drinks for E210-219
- Advised to reintroduce milk, wheat and nuts
- Advised to check toothpaste and lip balm for benzoates, or parabens

# THANKS FOR LISTENING