



Diet & asthma

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Asthma - the problem



- Affects 300 million people worldwide



- UK - 5.4 million people including 1.1 million children



- 3 people in the UK die from asthma every day
- More common in affluent countries like the UK, USA and Australia
- But, people in poorer countries tend to have more severe symptoms

Known causes of asthma



- Family history
- Modern lifestyles: hygiene, carpets, pets & diet



- Smoking during pregnancy, parents who smoke



- Environmental pollution
- Viral infections
- Irritants in the workplace - occupational asthma

Studying diet & asthma



- **Cross-sectional studies:** a snapshot in time
- **Pros** - relatively easy and cost-effective
- **Cons** - impossible to tell which came first, the diet or the asthma



Studying diet & asthma



- **Case-control studies:** compare hundreds of people who have asthma to hundreds who don't
- **Pros** - relatively easy and cost-effective
- **Cons** - relies on people's memories and affected by their prejudices

Studying diet & asthma



- **Cohort studies:** Collect data on a group of newborns, keep collecting information for years afterwards
- **Pros** - provide information on cause and effect
- **Cons** - take many years to complete, costly



Studying diet & asthma



Clinical trials

- **Double-blind randomised controlled trial** is the gold standard
- **Pros** - can prove a link
- **Cons** - very expensive, take a long time to undertake and follow-up



Studying diet & asthma



Problems:

- Impossible to get a completely accurate idea of a person's diet
- Have to use proxy measures eg wheeze, allergies
- Many definitions of asthma
- Thousands of variables
- Confounding factors eg wealth, education, smoking, presence of allergies

Possible links



- Foods can trigger symptoms
- Diet during pregnancy, infant diet, breastfeeding
- Allergies might result in asthma
- Dietary balance might affect asthma risk, or protect or cause symptoms
- Individual dietary components & dietary supplements



Common dietary triggers



- Cow's milk
- Eggs
- Fish
- Shellfish
- Yeast products
- Nuts (peanuts and tree nuts)
- Food colourings, preservatives
- Royal jelly products
- Red wine
- Sulphur dioxide, sulphites
- Salicylates



Maternal & infant diet



Pregnancy

- Mother's diet might affect her child's asthma risk
- Lots of supplements have been tried eg vitamins, probiotics, fish oil, antioxidants, zinc... but no conclusive results
- Smoking and alcohol should be avoided



Maternal & infant diet



Breastfeeding

- Lots of studies undertaken with conflicting results
- Some of the biggest studies do show some protection
- Cohort study of 4,089 newborns - reduced risk of asthma at 4 yrs for breastfed infants*
- Current advice is for infants to be breastfed exclusively for 6 months



* Kull et al. *JACI* 2004; 114(4): 755-60

Maternal & infant diet

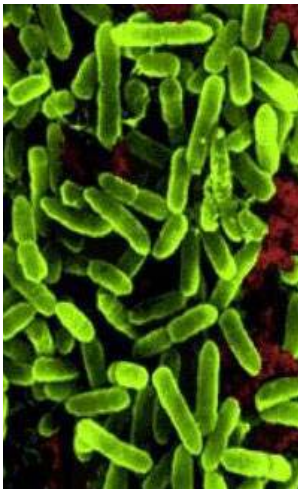


Introduction of solid food

- Organisations advise delayed introduction of solid food for ≥ 4 months to avoid allergies and asthma
- But evidence is scarce
- Cohort study of over 2,000 children found no evidence to support delayed introduction of solids*

* Zutavern et al. *Pediatrics* 2008; 121(1): e44-52

Maternal & infant diet



Probiotics

- Link to hygiene hypothesis
- More variety and 'better' bacteria if infants are breastfed
- Supplements have been tried:
 - no protective effect against allergies for naturally-born children
 - some protection for those born by caesarean*

* Kuitunen et al. *JACI* 2009; 123(2): 335-41

Food allergies



- Affect around 1.5% of adults and 6-8% of children
- Known risk factor for asthma
- People with food allergies tend to have more severe asthma symptoms
- People with asthma are at greater risk of severe food allergy reactions



Food allergies



Isle of Wight prevention study

- Children at risk of asthma and allergies
- Breastfeeding mothers ate 'low allergen diet'; infants had low allergen formula
- Children ate no dairy, eggs, wheat, nuts, fish or soya for 12 months
- House dust mite levels reduced using mattress covers and pesticide
- Children had fewer allergies and asthma at age 8*



* Arshad et al. *JACI* 2007; 119(2): 307-13

Food allergies



Peanuts



- Advice has changed frequently
- Committee on Toxicology report in 2008* states:
 - There's no evidence to support peanut avoidance
 - Eating peanuts might actually protect against peanut allergy, it's impossible to say either way

* <http://cot.food.gov.uk/cotstatements/cotstatementsyrs/cotstatements2008/cot200807peanut>

Dietary patterns



- Overall dietary balance might be more important than individual components
- **Childhood** diets thought to protect against asthma:
 - A 'Mediterranean diet' rich in fruit & vegetables, low in saturated fat
 - High intake of starch, cereals & vegetables
 - High milk consumption, particularly unpasteurised

Dietary patterns



Adults:

- No dietary pattern identified that can protect against asthma
- 'Western diet' (pies, pizza and puddings) might make symptoms worse
- 'Nuts and wine diet' might offer some protection against asthma attacks*

* Varraso et al. *ERJ* 2009; 33(1): 33-41

Vitamin D



- Essential for bones, teeth, healthy immune system
- Skin makes vitamin D when exposed to sunlight; this is our major source
- A small amount comes from our diet, especially fish, eggs, fortified margarine & cereals
- Deficiency is common, especially in winter



Vitamin D



- Supplements during pregnancy might decrease asthma risk in children
- Two big trials are underway in USA and Denmark: results due in 2014
- Low vitamin D levels linked to more severe asthma symptoms
- Vitamin D might increase effectiveness of asthma treatments: Asthma UK trial underway



Antioxidants



- Remove or prevent the formation of free radicals
- Antioxidant rich: fruit, vegetables, nuts, grains, fish
- Include: Beta-carotene, lycopene, selenium, vitamins A, C & E
- Levels in western diets have gradually decreased
- Higher levels of free radicals in the lungs of people with asthma - cause or effect?

Antioxidants



- A diet rich in antioxidants might reduce asthma risk or prevent symptoms
- Recent meta-analysis: a low dietary intake of vitamins A and C is linked to increased asthma risk*
- Supplementation trials to date have been disappointing; supplements are associated with health risks**

* Allen et al. *Thorax* 2009 Apr 30 [Epub head of print]

** <http://www.cochrane.org/reviews/en/ab007176.html>

Summary



- Diet can impact on asthma risk and asthma symptoms
- Most important risk factor is our genes, combined with lifestyle and exposures
- We now know part of the picture on diet and asthma
- This information is theoretical, further studies are needed to determine if we can use diet to lower asthma risk



asthma.org.uk