

Literature review early exposure to food allergens and development of food allergy

Area of research interest: [Food hypersensitivity](#)

Study duration: 2007-10-01

Planned completion: 5 May 2008

Project code: T07052

Conducted by: T07052

Background

Peanut allergy is one of the most prevalent food allergies in the UK and commonly receives attention in the media because very small amounts can trigger severe, sometimes fatal, allergic reactions in susceptible people. Onset of peanut allergy typically occurs in childhood, with children sometimes reported to react on their first known occasion of eating peanuts.

In 1998 the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT), which advises the UK Government, issued precautionary advice to mothers whose children have a family history of allergic diseases (asthma, eczema, food allergies etc), that they may wish to avoid peanut consumption during pregnancy and breast-feeding and until the infant is 3 years of age. This advice followed a review of the scientific evidence surrounding peanut allergy which suggested the possibility that infants could be sensitised to peanut allergens as a result of exposure before birth or during breastfeeding.

This precautionary advice has recently come under scrutiny, as further scientific evidence on the development of peanut allergy and other food allergies in children is emerging. We are therefore funding a systematic review of all the published scientific literature relevant to early life patterns of exposure or avoidance to major food allergens and the development of food allergy in children, since the COT advice was issued. The findings of this systematic review have helped the Agency to review the precautionary advice issued in 1998.

Research Approach

The systematic review comprised seven smaller systematic reviews of the literature from studies in humans and from experimental studies in animals, which covered the effects of:

- maternal diet (in terms of food allergens) in pregnancy and lactation, and the development of later food allergy in the offspring
- infants (in terms of food allergens) and later development of food allergy
- fetal exposure to food proteins (in utero) and later development of food allergy
- Non-dietary exposure to peanuts in infancy and the development of later food allergy
- that the 1998 Government advice has had on the prevalence of sensitisation and allergy to peanuts in UK children

Results

Findings and Conclusions drawn by the Researchers:

- there is no evidence, from seven human studies identified, of an association between maternal dietary intake of food allergens during pregnancy or lactation and the development of food sensitisation or food allergy in the child
- there were no studies identified in animals that investigated maternal consumption of peanut and sensitisation to peanut in the offspring. The available animal studies identified which used ovalbumin (egg) as the exposure suggest that maternal oral or mucosal exposure to ovalbumin may protect offspring from the development of allergy type immunological responses to egg, possibly with high dose
- evidence from human studies does not suggest that dietary exposure to or avoidance/delaying introduction of allergenic foods in childhood provides protection from subsequent development of sensitisation or allergy to foods
- evidence from animal studies suggests that oral exposure to low doses of food protein may induce sensitisation; whereas higher doses may result in tolerance. This was true for both peanut and ovalbumin allergens but the dose required to induce tolerance was higher for peanut
- it is likely that the fetus is exposed to small (but variable) amounts of food protein derived from the mother's diet and transported across the placenta. It is unclear, however, whether fetal exposure to allergens results in in utero sensitisation of the fetal immune system. Moreover, it is not possible to conclude that in vitro cord blood mononuclear cell responses observed following stimulation with food proteins necessarily reflect in utero exposure, in utero sensitisation, or an increased risk of clinical allergy during later life
- there is very little evidence available on non-dietary exposure to peanuts and the development of sensitisation or allergy to peanuts. However, one study did show an increased risk of peanut allergy in children who were exposed to skin creams containing peanut oil. There is some supportive evidence from experimental animal studies examining responses to peanut or ovalbumin. Further studies in humans are required in this area
- evidence from two studies which were designed to evaluate the impact of the COT advice found that more than 60% of women who became pregnant after the 1998 COT advice was issued, reduced their intake of peanuts, but few managed to totally avoid. There is no indication that the target group (women with a family history of atopy) were more likely to take up the advice, than the general population of mothers. The overall evidence from both studies showed that of children who developed peanut sensitisation or allergy, a substantial number (77% sensitisation, 40% allergy) of mothers reported that they reduced their intake of peanuts or avoided eating them
- there is no evidence to suggest that the 1998 COT advice is related to a change in peanut sensitisation or peanut allergy

The results of this project formed part of the evidence base considered by the COT in their recent review of the 1998 COT recommendations on peanut avoidance. A full statement of the COT's consideration has now been published and is available on the COT website.

Additional Info

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Published Papers

1. Thompson, R. L., Miles, L. M., Lunn J., Devereux, G., Dearman, R. J., Strid, J. and Buttriss, J. L. (2010). Peanut sensitisation and allergy: influence of early life exposure to peanuts. *British Journal of Nutrition*. 2010 May;103(9):1278-86. Epub 2010 Jan 26.

Research report

England, Northern Ireland and Wales

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