

The role of IgG in allergy and tolerance to common food allergens

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

Study duration: 2003-09-01

Planned completion: 1 February 2006

Project code: T07032

Conducted by: Addenbrookes Hospital, University of Cambridge

Background

In the past, most studies on the pathogenesis of food allergy have focused on the role of specific IgE and the immediate hypersensitivity reaction, but there is little data on the role of specific IgG.

Peanuts and egg are two of the commonest foods to cause allergy. Allergies to these foods normally first appear in young children and can cause a range of reactions varying from trivial to severe, and may even sometimes result in death. An allergy to egg normally resolves as a child grows up, but allergy to peanut tends to persist.

Research Approach

In order to establish the role of IgG in the development of allergic sensitisation and reactions to foods, a range of well-characterised individuals will be studied. These individuals will fall into one of the following clearly defined groups:

- 1) Peanut and egg allergic patients
- 2) Sensitised (IgE) asymptomatic subjects
- 3) Non-sensitised controls
- 4) Individuals with resolved allergy

Results

The aim of the project was to better understanding of the role of egg and peanut specific Immunoglobulin G (IgG) in food allergy.

The researchers found that all the infants in the study had significant levels of specific IgG antibodies to both peanut and egg whether they were allergic or not. The levels of egg specific IgG were similar in the egg allergic infants and the non allergic group or the 'peanut allergic but not egg allergic' group. The levels in the case of egg reflected how much of the food had been eaten by the child in their diet and the age at which the food was introduced. This suggests that high egg-specific IgG is not an indicator of egg allergy but is a marker of (dietary) exposure.

The levels of peanut-specific IgG antibodies were found to be, on average, higher in the peanut allergic infants than in either the egg allergic or control groups. However, most infants are known to react to their first known ingestion of peanut, and therefore the level of peanut specific IgG is not thought to be directly related to the level of consumption. Further, although the level of peanut

specific IgG may be associated with the allergic status of the child, there was a large overlap in the levels of peanut IgG antibody between allergic infants and non-allergic infants which meant that it was not possible to use specific IgG levels to discriminate between peanut allergics and non-peanut allergics.

The results of the study have shown that it is not possible to use the level of allergen specific IgG as a diagnostic test for peanut allergy or egg allergy, as no cut-off level at which an individual child could be reliably identified as allergic could be identified from the results. This project has informed our advice on which markers in the immune system are the most (and least) helpful in the diagnosis of food allergy.

Reference

1. Pattern of immunoglobulin G responses to egg and peanut allergens are distinct: ovalbumin-specific immunoglobulin responses are ubiquitous, but peanut specific immunoglobulin responses are up-regulated in peanut allergy. S.S. Tay, A.T. Clark, J. Deighton, Y. King and PW Ewan, *clinical and experimental allergy*, 37, 1512-1518

Dissemination

For any enquiries concerning this research project, please contact the relevant Programme contact or email: cst@foodstandards.gsi.gov.uk

Research report

England, Northern Ireland and Wales

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