HLA-A, B, DR, DQ IN NUT ALLERGY PATIENTS

WELSH BLOOD SERVICE
GWASANAETH GWAED CYMRU

[1]DEPARTMENT OF MEDICINE, LLANDOUGH HOSPITAL;
[2]WELSH TRANSPLANTATION AND IMMUNOGENETICS LABORATORY;
[3]SCHOOL OF APPLIED SCIENCE, UNIVERSITY OF WALES INSTITUTE CARDIFF

S HAND[1], C DARKE[2], J THOMPSON[2], C STINGL[1], S ROLF[3], K P JONES[3] AND B H DAVIES[1]

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Introduction

Peanut and tree nuts are among the most common foods provoking severe allergic reactions including fatal anaphylaxis. However, little is known of the underlying genetic and immunological mechanisms involved. This study was designed to identify any primary HLA phenotype disturbances in patients with peanut and/or tree nut allergy.

Patients group

The patients consisted of 84 unrelated subjects aged between 3 and 51 years whose nut allergy was confirmed by clinical assessment, skin prick testing and measurement of specific IgE to seven different nut species. Two patients were monosensitised to peanut, 63 were sensitised to peanut and tree nuts and 19 patients were sensitised to tree nuts only. The age of onset was between 1 and 51 years and patients' symptoms varied from mild to severe.

Control groups

An atopic control group comprised 82 random subjects with a clinical history of atopy and positive skin tests to at least two common allergens. They all lacked a history of nut allergy that was confirmed by negative skin prick tests, to peanut and tree nuts.

In addition, 1,798 HLA typed regular blood donors served as a random population control. No information was available on this group concerning atopy or specific allergies.

HLA typing and phenotype frequency analysis

HLA-A, B, DRB1 and DQB1 typing was performed by our standard PCR-SSP procedure at the 'split specificity' level as a minimum.

HLA frequency comparisons were made using Woolf-Haldane analysis and p-values were corrected (p_{corr}) for the number of comparisons made, using Edwards' method.

Results

- HLA-B*07 was low in the atopic controls (12.2%) compared to the other two groups (patients 28.6%, $p < 0.05$; blood donor controls 26.9%, $p < 0.01$).
- DRB1*11 was high in the patients (15.5%) versus the atopic controls (3.7%), $p < 0.02$. Comparisons between the blood donors (10.1%) and the patients and atopic controls were not significant ($p = 0.090$ and 0.084, respectively).
- DRB1*13 was high in the patients (28.6%) versus the blood donors (18.7%), $p < 0.05$. Comparison between the patients and atopic controls (19.5%) was not significant ($p > 0.05$).
- DQB1*06 was high in the patients (55.9%) versus the blood donors (40.6%), $p < 0.01$. Comparison between the patients and atopic controls (41.5%) was not significant ($p = 0.06$).
- All corrected p-values were non-significant ($p_{corr} > 0.05$) – Table 1.

Table 1. HLA differences between nut allergy patients and controls.

HLA-	Frequency (%) in:		p-value	Frequency (%) in blood donor controls	p-value
	Nut allergy patients	Atopic controls			
B*07	28.57	12.20	<0.05	26.86	n/s
DRB1*11	15.48	3.66	<0.02	10.12	n/s
DRB1*13	28.57	19.51	n/s	18.74	<0.05
DQB1*06	55.95	41.46	n/s	40.55	<0.01

All p-values are for comparisons with nut allergy patients; n/s = non-significant ($p > 0.05$)

All corrected p-values were non-significant ($p_{corr} > 0.05$).

Comments

At 'split specificity' resolution and with undifferentiated nut allergy patients there were no major disturbances in the frequency of HLA-A, B, DRB1 or DQB1 phenotypes.

However, the altered frequency of HLA-DR11, seen between patient and atopic controls, merits further study in view of the recently reported associations between DR11 and peanut and house dust mite allergy and sensitivity to various drugs (see References).

References

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