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MEETING ABSTRACT Open Access

Testing an emerging animal model for use in the allergenicity assessment of food

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Background

The regulatory assessment of novel food includes tests for allergy. The World Health Organization suggests tests in an animal model of allergy despite the lack of a validated model. We aimed to confirm if C3H/HeJ mice would respond to food of high allergenic potential (peanut), but not to food of low allergenic potential (turkey, potato, spinach).

Methods

In the first study, C3H/HeJ mice were orally treated, once per week for two weeks, with adjuvant and 0 or 2 mg of peanut or turkey. A second study used adjuvant and 0, 0.1, 1 or 2 mg of peanut, potato or spinach. Blood IgE antibodies and spleen interleukin-4 were quantified.

Results

Mice treated with 2 mg peanut developed peanut-specific IgE levels which were significantly higher than control mice ($p<0.001$, n=10/group). Mice treated with 2 mg turkey developed a similar IgE response to turkey ($p<0.001$, n=10/group). In the second study, allergy was only triggered in one of ten mice treated with 2 mg peanut. Two of ten mice exposed to 1 mg potato had a response. There were no IgE responders to spinach. Spleen cells from both the peanut- and the spinach-treated mice secreted more allergy-promoting interleukin-4 than controls ($p<0.01$, n=7-24/group). Levels were not modified in potato-treated mice.

Conclusions

C3H/HeJ mice developed food allergy markers to peanut. However, the incidence varied between experiments. Some mice developed a similar response to foods with low allergenic potential. Thus, this model may not be appropriate for safety assessment of novel food.

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