750 Long Term outcome of Peanut Oral Immunotherapy (OIT) in Patients Unable to Reach Maintenance Goal

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RATIONALE: Desensitization of peanut allergic patients by Oral-Immunotherapy (OIT) up to 3000mg peanut protein (PP) enables unlimited peanuts consumption. Some patients, however, have difficulties reaching this maintenance dosing. Knowledge regarding the long-term therapeutic efficacy of patients on lower maintenance doses is limited.

METHODS: The peanut-OIT treatment protocol consisted of an in-hospital initial induction-desensitization phase, in which a maximal individualized tolerated dose was determined and then consumed daily at home. Doses were gradually increased on a monthly basis in a day-hospital care setting. Patients with technical difficulties ingesting the maintenance dose or limited due to allergic reactions were placed on lower daily maintenance doses and instructed to avoid ingesting amounts of PP above it.

RESULTS: Eleven patients ranging from 6-19 years, with starting doses of 12.5 (3-150) mg PP, reached maintenance doses of 1200 (600-1500) mg (median (range), respectively). Duration of OIT-treatment was 5 (3-13) months (median (range), respectively). All patients reacted during induction and 5/11 (45%) experienced reactions during home treatment, including one requiring Epi-Pen. In long-term follow-up after 14 (6-68) months (median (range), respectively), the average SPT-wheal size was reduced from 8.9 to 3.6 millimeter and only 4 subjective reactions were reported. Oral food challenges up to 3000 mg PP were successful in 10/11 patients. One patient whose maintenance dose was 600mg reacted to 2100mg PP. Full compliance to daily dose consumption was reported by 8/11 patients while 3/11 occasionally stopped for greater than a week.

CONCLUSIONS: Prolonged consumption of lower maintenance doses may facilitate complete desensitization in patients experiencing difficulties during peanut-OIT.

751 Epitope Mapping for the Non-Specific Lipid Transfer Proteins (nsLTP) Among Peanut Allergic Patients

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RATIONALE: Plant food allergy in many European countries, especially in the Mediterranean, are often caused by nsLTP. Studies focused on nsLTP reactivity in patients from the United States are lacking. Our aim was to identify IgE and IgG4 epitopes for the 7 known nsLTP allergens, including the peanut allergen Ara h 9 and 6 homologous allergens from other plants, recognized by peanut-allergic patients from the United States.

METHODS: Synthetic overlapping 15-mer peptides offset by 5 amino acids of the 7 nsLTP allergens from peanut (Ara h 9), walnut (Jug r 3), peach (Pru p 3), kiwi (Act d 10), almond (Pru du 3), and tomato (Lyc e 3.0101 and Lyc e LTP3MAC) were spotted onto microarrays slides. Sera from 15 peanut allergic patients from the US enrolled in a Phase II Oral Immunotherapy trials were applied to the slides to test for IgE and IgG4 binding to the peptides using immunofluorescence. The pre-trial sera of patients in Phase II trial has been examined.

RESULTS: IgE and IgG4 epitope maps for multiple nsLTP allergens were developed. Of the 7 allergens analyzed, the ones from peanuts, walnuts, peaches, and tomatoes had a higher number of peptides recognized by US patients with confirmed peanut allergies.

CONCLUSIONS: Certain regions of the proteins are recognized more often indicating that they represent a conserved and possible cross-reactive region.

752 Nanoallergens: A Nanoparticle Based Platform for Assessment of Immunogenic Peanut Epitopes in a Clinical Population

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RATIONALE: Currently, the only way to reliably diagnose the severity of a patient's allergic condition is through a food challenge, which is inherently dangerous to the patient. In our laboratory, we have developed a novel technique called nanoallergens which can predict the severity of a patient's allergy.

METHODS: Nanoallergens were designed to effectively display individual allergen epitopes from the major peanut proteins Ara h2 and Ara h 6 on their surfaces. As we demonstrate in our experiments, the detailed engineering of these nanoallergens make them very efficient in triggering degranulation in an *in vitro* degranulation assay with RBL cells primed with peanut allergy patient serum (purchased from a commercial source (N=4)). We also proved their efficiency in degranulation assays using blood samples obtained from children between the ages of 2-15 with clinical history of peanut allergies (N=6). Lastly, nanoallergens were used in a basophil activation test (BAT) triggered by individual Ara h 2 and Ara h 6 epitopes to determine the extent of immunogenicity of these peanut protein epitopes. Identified immunogenic epitopes were then compared to clinical histories.

RESULTS: *In vitro* analysis from initial RBL cell studies revealed a group of 10 IgE binding epitopes that were then used in the *ex vivo* BAT analysis. BAT testing demonstrated a group of epitopes common to patients with a history of urticarial reactions but no anaphylaxis reactions.

CONCLUSIONS: This preliminary study demonstrated that nanoallergens can be used with BAT to efficiently determine the immunogenic epitopes for a particular patient and potentially predict clinical reactions to allergens.