SATURDAY

258 Long-Term Safety Behaviors and Receipt of Specialized Allergy Care Following Oral or Sublingual Immunotherapy

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RATIONALE: Oral and sublingual immunotherapy (OIT/SLIT) for peanut allergy may reduce severe reactions with accidental exposure. However, it is not known how the degree of desensitization after OIT/SLIT impacts safety behaviors and patterns in clinical care over time.

METHODS: A subset of subjects who received peanut OIT/SLIT were followed in a longitudinal observational study for up to eight years. Cumulative tolerated dose (CTD) during the final oral food challenge on immunotherapy was recorded. At the last follow-up visit, subjects completed questionnaires to assess improvement in quality of life (QOL), safety behaviors (routinely carrying Epipens, eating out, and engaging in unsupervised activities), and ongoing care by an allergist. Subjects with missing questionnaire data were excluded (n=11). Responses were examined for differences by CTD using a dichotomized variable (5000 mg versus <5000 mg).

RESULTS: Data were analyzed for 58 subjects (mean age 9.8±2.8 years, 43.1% female). 79% (n=46) reported definite improvement in QOL. 86.2% (n=50) carried an Epipen, 94.8% (n=55) reported eating out, and 84.5% (n=49) reported engaging in unsupervised activities. Compared to subjects with lower CTD, subjects with higher CTD were less likely to carry an Epipen (80.6% versus 95.5%; Fisher's p=0.14) and to see an allergist (33.3% versus 59.1%; Fisher's p=0.6).

CONCLUSIONS: The majority of subjects undergoing OIT/SLIT reported increased risk taking behaviors relating to accidental allergen exposure. However, CTD appears to modify specific safety behaviors including carrying an epipen as well as receipt of long-term use of specialized allergy care, suggesting ongoing patient education is needed to reinforce safety behaviors regardless of CTD.

259 Peanut oral immunotherapy induces gastrointestinal eosinophilia in a longitudinal randomized controlled trial

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RATIONALE: Gastrointestinal side effects are common during oral immunotherapy (OIT) and eosinophilic esophagitis (EoE) is a potential complication. We aimed to characterize eosinophilic gastrointestinal responses to peanut OIT.

METHODS: Twenty adult subjects with peanut allergy were randomized to peanut OIT (n=15) and placebo (n=5); one additional subject withdrew before randomization. Serial gastrointestinal biopsies were obtained at baseline (n=21, 0 weeks), following dose escalation (n=10, 52 weeks), and maintenance (n=12, 104 weeks). Endoscopic findings were characterized using the EoE endoscopic reference score (EREFS). Biopsies were assessed for eosinophils per high-power field (eos/hpf) and other pathologic features using EoE Histologic Scoring System (EoEHSS). Immunohistochemical staining for eosinophil peroxidase (EPX) was performed and quantified using automated image analysis.

RESULTS: At baseline, no subjects reported current gastrointestinal symptoms; however, three participants had ≥15 eos/hpf (esophagus) and all subjects had dilated intercellular spaces. OIT induced significant eosinophilic inflammation at 52 weeks in the proximal, middle, and distal esophagus; whereas no significant changes were seen in the placebo arm. These changes corresponded with significant increases in EoEHSS scores and EPX deposition. Four subjects (57%) had new-onset or worsening eosinophilia (≥15 eos/hpf) during OIT (week 52) and one met clinicopathologic criteria for EoE. Three OIT subjects (43%) also crossed histologic thresholds for eosinophilic gastritis and/or duodenitis. In most, OIT-induced gastrointestinal eosinophilia (GE) resolved by week 104. Gastrointestinal symptoms were not clearly associated with GE.

CONCLUSIONS: Peanut OIT induces GE and, less commonly, EoE. This pilot study demonsrates OIT-induced GE may be transient and is not always associated with gastrointestinal symptoms.

260 Berberine-containing Natural Medicine Confers Sustained Peanut Tolerance Associated with Distinct Microbiota Signature

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RATIONALE: Gut microbiota play an important role in food allergy. We previously showed that the natural compound berberine (BBR) reduces IgE and others have reported that BBR alters gut microbiota implying a potential role for microbiota changes in BBR function. We evaluated an orally available BBR-containing natural medicine (BCNM) for efficacy as food allergy treatment and explored whether treatment-induced changes in gut microbiota correlated with therapeutic outcomes

METHODS: C3H/HeJ mice were orally sensitized with peanut and cholera toxin. Allergic mice were orally treated with BCNM or its individual components. Allergic mice given no treatment and naïve mice were controls. Mice received periodic post-therapy peanut exposures. Anaphylaxis was assessed by symptom visualization and measurement of body temperature. Histamine and serum peanut-specific IgE were measured by ELISA. IgE+B cells in spleen were assessed by flow cytometry. Fecal pellets were used for sequencing bacterial 16S rDNA by Illumina MISeq. Microbiota data were analyzed using microbiomeanalyst.ca.

RESULTS: BCNM-treatment regimen induced long-term tolerance to peanut accompanied by profound and sustained reduction of IgE. Symptom scores, plasma histamine, body temperatures, IgE levels and number of IgE+ B cells (P<0.05-P<0.001 vs Sham). Significant differences were observed for Firmicutes/Bacteroidetes ratio across treatment groups (P<0.05-0.01). Bacterial genera positively correlated with post-challenge histamine and PN-IgE included Lachnospiraceae, Ruminococcaceae and Hydrogenanaerobacterium (R^2= 0.82 to 0.36, P<0.05-0.0001) while Verrucromicrobiacea. Caproiciproducens, Enterobacteriaceae and Bacteroidales, were negatively correlated (R^2= -0.73 to -0.43, P<0.05-0.0001)

CONCLUSIONS: BCNM is effective as food allergy treatment and its benefits are associated with a distinct microbiota signature.