L10 The Effect of Subcutaneous German Cockroach Immunotherapy (SCIT) on Nasal Allergen Challenge (NAC) and Cockroach-specific Antibody Responses Among Urban Children and Adolescents

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RATIONALE: Cockroach allergy contributes to asthma and rhinitis morbidity among many urban children. Treatment with cockroach SCIT could be beneficial.

METHODS: 8-17 year-old children with mild-moderate asthma from 11 urban sites participated in a randomized double-blind placebo-controlled SCIT trial using non-standardized, glycerinated German cockroach extract. Positive cockroach skin tests, cockroach-specific IgE, and nasal challenge response with total nasal symptom scores (TNSS) ≥6 or maximal sneeze scores of 3 during a graded NAC were required for enrollment. Following dose escalation, 0.4 ml of undiluted extract was targeted for maintenance dosing (~7 mcg Bla g2/dose). The primary endpoint was change in NAC-induced mean TNSS from baseline to one year post randomization. Changes in cockroach-specific IgE (CRsIgE) and IgG4 (CRsIgG4) were also analyzed.

RESULTS: Mean TNSS did not significantly change from baseline in either group (placebo n=29, SCIT n=28). There was no significant difference in the change in mean TNSS between placebo and SCIT [−0.79±0.35 vs. −1.02±0.37, respectively, difference=0.2(−1.15, 0.70), p=0.63]. Baseline CRsIgE and CRsIgG4 didn't differ between groups. Mean CRsIgE decreased in both groups following treatment: 3.6 to 2.3 kU/L (0.64 fold change), p=0.015 and 8.3 to 4.2 kU/L (0.51 fold change), p<0.001 in placebo and SCIT respectively, but did not differ between groups [p=0.33]. Significant increases in CRsIgG4 post-treatment were observed among SCIT recipients only: 0.07 to 12.3 mg/L (176 fold change), p<0.001.

CONCLUSIONS: Cockroach SCIT increased CRsIgG4 levels but did not significantly alter NAC-induced TNSS responses. The extent to which NAC in these children may reflect clinical efficacy for rhinitis or asthma is uncertain.

L11 The Pediatric Asthma Risk Score: A New Gold Standard for Asthma Prediction

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RATIONALE: Early prediction of asthma is critical to identify potential primary prevention strategies. The Pediatric Asthma Risk Score (PARS) is a continuous score to predict early-life asthma but was developed and validated in relatively homogenous populations. We compared PARS directly to the Asthma Predictive Index (API) and validated in 10 cohorts with varying race, ethnicity, sex, cohort type, missing data and birth decades, and perform a meta-analysis across all 10 cohorts.

METHODS: We utilized data from 5674 children participating in the Children's Respiratory and Environmental Workgroup. We applied both PARS and the API in each cohort, as well as harmonized across all cohorts, and directly compared the ability of each tool to predict asthma development at ages 5-10.

RESULTS: The PARS area under the curve (AUC) was significantly higher than the AUC of the API in 9 cohorts (p-value range 0.01 - <0.001). The PARS AUC did not differ by cohort type (high risk or general population), decade of enrollment, race, sex, ethnicity, missing PARS factors or polysensitization definition (skin prick test vs. specific IgE). The weights of the 6 PARS factors in the meta-analysis were very similar to the original weights, validating the original PARS scoring.

CONCLUSIONS: This multi-cohort study makes the PARS the most validated model of asthma prediction in children to date, not only with respect to the number of cohorts used but also with regards to capturing the diversity of asthma in the United States. Future studies may consider PARS the new gold standard in pediatric asthma risk prediction.