STRONG CHILDREN'S RESEARCH CENTER

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ABSTRACT

Title: Dietary and Environmental Variables Associated with Atopic Disease at 18 months Among High-Risk Children

Background: The prevalence of atopic disease has dramatically increased over the last several decades, now impacting up to 35% of children.[1] Atopic disease often presents in early infancy as atopic dermatitis (AD), food sensitization, and/or food allergy (FA). Together with allergic asthma (AA) and allergic rhinitis (AR), these conditions form the "Atopic March."[2] Primary prevention strategies remain largely unsuccessful, and even best practices for disease management cannot fully alleviate the significant burden of allergy on atopic children and their families. With disease manifestation as early as the first six months of life[3], it is important to identify early factors associated with atopic disease in order to halt the atopic march.

Objective: We sought to identify demographic, dietary, and/or environmental variables that were associated with development of allergic disease among children in a high-risk population. Questionnaire data were collected pre- and postnatally from families of 79 high-risk children from urban/suburban Rochester with a familial history of atopic disease, as part of the larger birth cohort study Zooming in to Old Order Mennonites (ZOOM), which is assessing immune system development in farming and non-farming communities.[4,5] Differences in variables of interest between atopic and non-atopic children at baseline, 6-week, 6-month, 12-month, and 18-month questionnaires were analyzed using Mann-Whitney and Fisher's exact tests for continuous and categorical data, respectively. Atopic disease (FA or AD) was diagnosed by a physician, using a cutoff of 18 months for this analysis.

Results: 79 high-risk Rochester children were included in this research project, 23 of whom had been clinically diagnosed with atopic disease by 18 months. There were no significant differences in characteristics such as sex, season of birth, delivery mode, number of atopic parents, number of older siblings, daycare attendance, antibiotic usage, and exposure to pets. Maternal AD diagnosis (current or outgrown) tended to be associated with child atopic diagnosis ($p=0.0592$), as did current maternal FA diagnosis ($p=0.0739$). Non-atopic children tended to have higher rates of exclusive and non-exclusive breastfeeding through 12 months, although these results were not statistically significant ($p=0.0501$-0.7799). Notably, soy and seeds were significantly more frequently used in the homes of non-atopic children than in those of atopic children at the 6-month time point ($p=0.0029$ and $p= 0.0071$).

Conclusion: Within our high-risk cohort, we identified limited lifestyle factors associated with atopic disease development by 18 months. However, these data were not powered to analyze individual factors but designed to compare urban and farming lifestyles.[5] It remains to be seen if increased soy and seed usage protect against allergic disease (e.g., through anti-inflammatory properties[6,7]) or are biomarkers of diet quality and/or diversity. Additionally, our study was limited by small sample size. Future research should utilize more specific, more quantitative, and more frequent measures of soy and/or seed usage in the home. Further studies should also validate our preliminary findings on breastfeeding practices; the literature remains unclear on the impact of breastfeeding through 12 months on FA and AD.

References

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