Early Childhood Environment Related to Microbial Exposure and the Occurrence of Atopic Disease at School Age


PURPOSE. There has been much interest in the effect of various microbial exposures early in life on the subsequent development of atopic disease. This study aimed to examine the effects of several exposure types on atopic sensitization.

STUDY POPULATION. This was a cross-sectional study of 4111 Dutch schoolchildren aged 8 to 13 years.

METHODS. A questionnaire evaluating day care attendance before age 4, cats or dogs in the home before age 2, siblings, history of doctor-treated airway disease before age 2, and current respiratory status was used. Atopic status was tested by either skin-prick testing or antigen-specific immunoglobulin E levels to multiple common antigens.

RESULTS. Complete data were available for 1555 of the participants. Atopic sensitization was less frequent in children who attended day care (adjusted odds ratio: 0.74; 95% CI: 0.56–0.99) or had a pet in the home (adjusted odds ratio: 0.78; 95% CI: 0.61–0.99). There was no statistically significant association between the presence of siblings or the occurrence of doctor-treated airway disease and atopy.

CONCLUSION. Day care attendance and having a pet in the home may provide a protective effect against atopic sensitization.

REVIEWER COMMENTS. This study attempts to help clarify factors that may be associated with the primary development of atopy, which has been an area of great interest, especially given the rising prevalence of allergic disease. The results are consistent with many other studies indicating that microbial exposure early in life may have a preventive effect. Additional studies, including prospective cohorts, are being performed to define these associations more clearly. With luck, one day we will be able to use this information to design effective preventive strategies.

Individual and Neighborhood-Level Factors in Predicting Asthma


PURPOSE OF THE STUDY. To investigate the association between asthma and neighborhood-level social and physical indicators. A secondary goal was to identify individual-level predictors for developing childhood asthma.

STUDY POPULATION. Cross-sectional study comprised of 2544 children, aged 5 to 18 years, from a network of 6 Midwestern urban primary care clinics (Indiana University Medical Group in Marion County, Indiana). A total of 1541 black children (947 females and 594 males) and 1003 white children (568 females and 435 males) were evaluated.

METHODS. A medical chart review was conducted to identify those with physician-diagnosed asthma and record demographic data to ascertain socioeconomic indicators. Other data for neighborhood factors such as median age of housing, family income, education, single-parent family, and language isolation were obtained through the Social Assets and Vulnerabilities Indicators Project. Medical chart data were used to compute age- and gender-adjusted BMI percentiles. Multiple logistic-regression models were used to analyze the data.

RESULTS. On the individual level, this study found that asthma prevalence for black children was 4% higher than for white children and that males had a 9% higher risk than females. BMI had different effects for males and females. Males who were normal weight and those at risk of being overweight had similar risks of asthma. However, males who were overweight had a higher risk of asthma than boys who were at risk of being overweight. In contrast, females who were overweight and those at risk of being overweight had similar risks of asthma, and the rates were substantially higher compared with those for females who were normal weight. On the neighborhood level, there was no trend in rising asthma rate with the rise in the median age of housing. Children from very-low-income-level neighborhoods had the same asthma rates as those children from moderate- or middle-income neighborhoods.

CONCLUSIONS. The authors concluded that in a predominantly urban population of children, the highest likelihood of having asthma is among young, black, overweight males and the lowest rate is among older, white, normal-weight females. There was no association between asthma and neighborhood characteristics or median family incomes.

REVIEWER COMMENTS. Although the data from this study did not support the hypothesis that lower neighborhood socioeconomic status and older age of homes were associated with childhood risk of asthma, other studies through the National Cooperative Inner-City Asthma Study suggest that other environmental factors may be involved in urban populations, such as higher cockroach, rat, and mouse allergen levels found in inner-city
homes and sensitization to these allergens as a risk factor for developing asthma in urban neighborhoods. Asthma is the most common chronic childhood disease; thus, the findings from this study, that increased BMI is associated with increased risk of asthma, is additionally concerning because the rate of childhood obesity is increasing among our nation’s children.

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The Canadian Childhood Asthma Primary Prevention Study: Outcomes at 7 Years of Age

PURPOSE OF THE STUDY. To evaluate the effects of a multifaceted intervention program involving high-risk infants on the development of asthma at 7 years of age.

STUDY POPULATION. Of the original 545 high-risk infants in the Canadian Childhood Asthma Primary Prevention Study, 380 were evaluated at 7 years of age. Infants at high risk for asthma development were defined as those with at least 1 first-degree relative with asthma or 2 first-degree relatives with other immunoglobulin E–mediated allergic diseases.

METHODS. The initial 545 high-risk infants were randomly assigned before birth to a multifaceted intervention group (n = 279) or the control group (n = 266). The multifaceted intervention program, which was implemented before birth and during the first year of life, included house dust mite–control measures, pet-avoidance measures, avoidance of environmental tobacco smoke, breastfeeding, and/or using partially hydrolyzed whey formula. This study describes the follow-up assessment of 380 subjects at 7 years of age who completed a questionnaire and were evaluated by a pediatric allergist for asthma. Allergy skin testing and methacholine challenge were also performed.

RESULTS. A significantly lower number of subjects had pediatric allergist–diagnosed asthma in the intervention group (14.9%) than in the control group (23.0%; adjusted relative risk [RR]: 0.44). The prevalence of asthma, defined as wheeze plus bronchial hyperreactivity (methacholine challenge), was also significantly lower in the intervention group when compared with the control group (12.9% vs 25%, respectively; adjusted RR: 0.39). There was no significant difference in the diagnosis of allergic rhinitis or atopic dermatitis, allergen skin-test reactivity, or bronchial hyperreactivity alone between the 2 groups. Symptoms of wheeze and wheeze apart from colds in the last 12 months were significantly lower in the intervention group compared with the control group. There were no significant differences in nocturnal symptoms, exercise-related symptoms, medication use, emergency visits for wheeze, nasal symptoms, or skin rash.

REVIEWER COMMENTS. Asthma and allergic diseases likely result from a combination of environmental and genetic factors. This study showed that the prevalence of asthma was decreased after an intervention program implemented early in life. Thus, recommending environmental controls as a safe method to decrease the risk of developing asthma in high-risk patients is reasonable. It is unclear from this study whether a specific environmental control or a combination of interventions is more effective. It is interesting that no difference was noted in the prevalence of allergic rhinitis or atopic dermatitis between the groups, which, theoretically, could also be affected by environmental controls.

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The PREVASC Study: The Clinical Effect of a Multifaceted Educational Intervention to Prevent Childhood Asthma

PURPOSE OF THE STUDY. To evaluate the clinical effectiveness of a multifaceted education intervention to prevent childhood asthma.

STUDY POPULATION. General practitioners recruited 476 high-risk children during the prenatal period.

METHODS. These high-risk children were randomly assigned to either a control group, receiving usual care, or an intervention group, in which families received instruction from nurses on how to reduce exposure of newborns to dust mite, pet, and food allergens and passive smoking.

RESULTS. A total of 443 infants were followed up for 2 years. At 2 years of age, those in the intervention group (n = 222) had less asthma-like symptoms, including wheezing, shortness of breath, and nighttime cough, compared with those in the control group (n = 221). No significant differences in total and specific immunoglobulin E were found between the groups. During the first 2 years of life, the incidence of asthma-like symptoms was similar in both groups; however, subanalysis revealed a significant reduction in the females but not in the males in the intervention group.

CONCLUSIONS. The intervention used in this study was not effective in reducing asthma-like symptoms in high-risk
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