INFECTION AND ASTHMA SEVERITY IN CHILDREN: DATA FROM THE THIRD NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY (NHANES III)


Purpose of the Study. To determine the indicators of asthma severity among children in the United States with high and low levels of tobacco exposure.

Study Population. The subjects were 523 children (age: 4–16) with physician-diagnosed asthma.

Methods. The study population was obtained from the Third National Health and Nutrition Examination Survey (NHANES III), which is a Centers for Disease Prevention (CDC)-sponsored survey of a representative US population that underwent an extensive evaluation including a questionnaire, physical examination, lung function, and serum cotinine levels. Only children with a prior diagnosis of asthma were included in the analysis. Asthma severity was based on the frequency of symptoms. Serum cotinine levels were ranked as low (<0.115 ng/mL), intermediate (0.116–0.639 ng/mL), and high (0.64–20 ng/mL). Subjects that reported active smoking or had serum cotinine >20 ng/mL (indicating active smoking or use of chewing tobacco) were excluded. Cotinine levels were then compared with measures of asthma severity.

Results. Of the 13,944 children, 1025 had physician-diagnosed asthma. After exclusion for children <4 years old, those without physical examinations or cotinine levels and 13 with cotinine levels >20 ng/mL, 2052 children remained in the study group. Of these, 294 completed pulmonary function testing. Of the 523 tobacco-exposed children studied, 78.6% had mild asthma, 6.8% had moderate asthma, and 14.6% had severe asthma. The authors found that increased asthma severity was associated with higher cotinine levels. They also found that lower forced expiratory volume in 1 second (FEV₁) levels and a greater proportion of children with FEV₁ <80% were also associated with increased levels of cotinine. They found a mean FEV₁ decrement of 8.1% in the environmental tobacco smoke (ETS)-exposed children versus 1.8% in all the children. A surprising finding was that children with higher cotinine levels were less likely to have been hospitalized for asthma in the previous year, but all other measures of severity were higher in the group.

Conclusions. The authors conclude that their study provides evidence that children with asthma who are exposed to tobacco smoke have generally increased asthma severity and decreased lung function.

Reviewer’s Comments. Yet another study to provide evidence to our patients and their caregivers that tobacco smoke is detrimental to health, specifically in this study to children with asthma.

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ASTHMA IN EXERCISING CHILDREN EXPOSED TO OZONE: A COHORT STUDY


Purpose of the Study. The aim of this study was to investigate the relationship between newly diagnosed asthma and team sport participation in children exposed to different concentrations and types of air pollutants.

Study Population. A group of 3535 children, 9 to 16 years old, with no previous history of doctor-diagnosed asthma on a baseline questionnaire, were recruited from 12 southern California schools.

Methods. Interviewers administered baseline and yearly questionnaires regarding new diagnoses of asthma, asthma symptoms, and participation in any of 8 possible team sports in the past year. Air pollution monitoring stations in each community measured ozone, nitrogen dioxide, and particles ≤10 μm in diameter 10 (PM) every hour and PM 2.5 and acid vapor every 2 weeks. The risk of asthma was assessed relative to the number of high- or low-intensity team sports played at study entry, in communities with high or low levels of the measured air pollutants.

Results. The overall risk of developing asthma was not greater in the high-pollution communities compared with the low-pollution communities, after adjusting for baseline risk factors. In the 6 high-ozone communities, there was a 3.3-fold increased relative risk of developing asthma in children playing 3 or more team sports (95% confidence interval [CI]: 1.9–5.8) compared with those playing no sports. No increase in this relative risk was observed in children playing team sports in low-ozone communities. Across all communities, there was a 1.8-fold increased risk (95% CI: 1.2–2.8) of asthma in children who had played 3 or more team sports in the past year. Spending a large amount of time outside in high-ozone communities was independently associated with an increased risk of asthma. Exposure to pollutants other than ozone was not associated with a higher incidence of asthma.

Conclusions. The incidence of new asthma diagnoses was associated with heavy exercise in communities with high ozone levels, suggesting a contribution of outdoor exercise and air pollution to the development of childhood asthma.

Reviewers’ Comments. The results of this study suggest that increased ventilation rates of air containing high levels of ozone during heavy exercise may predispose children to developing asthma. Although playing high-intensity sports in high-ozone communities was associated with a greater incidence of asthma, data comparing the incidence of asthma in children playing high- and low-intensity sports was not shown. In addition, high-intensity individual sports, such as running or cycling, were not included in the questionnaires, so some children may have exercised more intensely than was documented. Ozone levels may be several-fold higher outdoors, so a comparison of the effects of outdoor and indoor exercise would have been useful. A description of asthma symptoms and the relationship of symptoms to sports participation would have been helpful to distinguish chronic wheezing from exercise-induced bronchospasm. Additional studies focusing on personal exposure to ozone, the intensity and location of exercise, and asthma symptoms will be helpful to further investigate this challenging question.

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INCREASED LEUKOTRIENES IN EXHALED BREATH CONDENSATE IN CHILDHOOD ASTHMA


Purpose of the Study. To determine if 2 markers of airway inflammation, leukotrieneB₄ (LTB₄) and cysteinyl leukotrienes (cys-LTs) can be detected in the breath of children with asthma and to look at the effect of steroid treatment on these mediators.
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