Effect of Exposure to Traffic on Lung Development From 10 to 18 Years of Age: A Cohort Study


PURPOSE OF THE STUDY. To investigate the association between residential exposure to traffic and 8-year lung-function growth in children.

STUDY POPULATION. Two cohorts of 4th-grade children with a mean age of 10 years were recruited from 12 southern California communities and were followed for 8 years. All eligible children were invited, and 3677 (82%) participated; 1445 children were followed for the full 8 years.

METHODS. Yearly pulmonary-function data were obtained for each participant by trained technicians using standard equipment. Indicators of residential exposure to traffic were determined by proximity of the child’s residence to the nearest freeway or major nonfreeway road and by dispersion-model estimates including residence distance to roadways, vehicle counts, vehicle emission rates, and meteorological conditions. Regional air pollution was monitored at a central site within each community. Baseline questionnaires were completed regarding demographic data, doctor-diagnosed asthma, in utero exposure to maternal cigarette smoke, and household exposure to air pollutants. Yearly questionnaires updated information on asthma and personal or environmental tobacco-smoke exposure. Regression models also included adjustment for height, BMI, and recent exercise and respiratory illness.

RESULTS. Children living <500 m from a freeway had reduced 8-year lung-function growth compared with children living >1500 m from a freeway (forced expiratory volume in 1 second deficit: −81 mL [95% confidence interval: −143 to −18]). This effect was slightly greater after adjustment for socioeconomic status and indoor air pollution and after omission of children who changed residence within the study area and continued to participate. Reduced lung-function growth was independently associated with freeway distance and regional air pollutant levels, including nitrogen dioxide, acid vapor, elemental carbon, and particulate matter with aerodynamic diameters of <10 and 2.5 μm. At 18 years of age, lung function was decreased among children who lived <500 m from a freeway (forced expiratory volume in 1 second: 97.0% [95% confidence interval: 94.6 to 99.4]; P = .013).

CONCLUSIONS. The adverse effects of local exposure to freeway traffic on children’s lung development are independent of regional air quality and may result in lung-function deficits later in life.

REVIEWER COMMENTS. This well-designed study suggests a causal association between residential traffic exposure and adverse effects on children’s lung function, especially for children living closest to freeways. A number of other recent cohort studies in children have also suggested associations between traffic-pollution exposure and asthma, respiratory symptoms, and allergic sensitization. Future studies are needed to determine minimum safe distances from major roadways for homes and schools and to continue evaluation of the guidelines restricting levels of airborne pollutants. Concerns regarding the effects of traffic pollutants on children’s respiratory health should continue to be a focus of asthma research.

FOOD ALLERGY

Prevalence and Cumulative Incidence of Food Hypersensitivity in the First 3 Years of Life


PURPOSE OF THE STUDY. To investigate the prevalence and incidence of food hypersensitivity.

STUDY POPULATION. The authors studied a whole population-based birth cohort of 969 children (91% of the target population) born on the Isle of Wight (United Kingdom) between 2001 and 2002.

METHODS. At age 1, 2, and 3 years, all children/parents were invited to attend a clinic for a medical examination and to answer a questionnaire pertaining to food hypersensitivity (FHS), defined as any adverse reaction to food. In addition, all children were asked to participate in skin-prick testing (SPT) to milk, egg, wheat, peanut, sesame, fish, aero-allergens, and other allergens as

Michelle L. Macy, MD
Harvey L. Leo, MD
Ann Arbor, MI

Elinor Simons, MD
Albany, NY

URL: www.pediatrics.org/cgi/doi/10.1542/peds.2008-2139T
RESULTS. Over the 3-year study period, 942 (97.2%) of the children were evaluated at 1, 2, or 3 years, whereas 83.3% were seen at 1, 2, and 3 years. Sensitization rates as determined by positive SPT results at 1, 2, and 3 years were 2.2%, 3.8%, and 4.5%, respectively. Of those who were evaluated at all visits, 33.7% reported food-related problems. FHS was reported in 8.3% of those who were evaluated at their 2-year visit and 8.3% at their 3-year visit. The cumulative incidence of FHS, according to FHS, the reported incidence of FHS is conservatively 5% to 6%, which represents a significant pediatric health problem and underscores the need for appropriate evaluation and management of adverse reactions to food.

PURPOSE OF THE STUDY. To examine the impact of reported food hypersensitivity (FHS) in 9-year-old children on parental perception of health-related quality of life (HRQoL).

STUDY POPULATION. A population-based birth cohort of 4089 Swedish children was used for a nested case-control study based on age 4 questionnaires (689 subjects, 689 controls). Parents completed questions pertaining to HRQoL at 9 years of age (~75% completion).

METHODS. FHS was defined as parental report of wheezing/prolonged cough, runny/stuffy nose in the absence of a cold, itchy/watery eyes, eczema, urticaria, vomiting/diarrhea, or other symptoms after ingestion of a specific food in the last year. Those with previous FHS but avoiding the food were considered to have FHS. Pronounced FHS was defined by wheezing/prolonged cough, >1 symptom, or symptoms occurring >1 time per month. A validated 28-item form was used to explore parental perceptions of their children’s HRQoL and was supplemented by a disease-specific nonvalidated questionnaire. Children with FHS at age 9 (212) were compared with those without FHS but with asthma, allergic rhinitis, or eczema (221) and to those with no allergic disease (581).

CONCLUSIONS. The authors reported that the cumulative incidence of FHS, according to food challenges and a clinical history, by 3 years of age was 5% to 6%. They concluded that when comparing their findings with the 1987 US study performed by Bock, there were no significant differences in the cumulative incidence of FHS.

REVIEWER COMMENTS. A major strength of this study is that the authors used an unselected population that may be more representative of patients seen by pediatricians than those followed by subspecialists. Because the authors set the definition of FHS to depend on agreeing to participate and meeting criteria for participation in food challenges, the reported incidence and prevalence of true adverse reactions to food is likely to be underestimated. Additional bias could exist because many subjects did not participate in food challenges because they either had skin-testing results that suggested that they would have a clinical reaction or they had histories of recent reactions or clinical improvement with elimination of the offending food. The importance of this study is that using the authors’ very conservative definition of FHS, the reported incidence of FHS is conservatively 5% to 6%, which represents a significant pediatric health problem and underscores the need for appropriate evaluation and management of adverse reactions to food.

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Michael Pistiner, MD, MMSc
West Nyack, NY

The Impact of Food Hypersensitivity Reported in 9-Year-Old Children by Their Parents on Health-Related Quality of Life
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Michael Pistiner

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