Allergy

PREDICTION AND PREVENTION

Pets at Birth Do Not Increase Allergic Disease in At-Risk Children

PURPOSE OF THE STUDY. To investigate the relationship between pet keeping at birth and the risk of sensitization, wheeze, allergic rhinitis, and eczema over the first 12 years in a cohort selected for familial allergy.

STUDY POPULATION. A total of 620 infants were enrolled in a prospective birth cohort in Australia between 1990 and 1994. Eligible infants had at least 1 first-degree family member with a history of eczema, asthma, allergic rhinitis, or severe food allergy.

METHODS. Data on pet keeping, demographics, and cord blood samples were collected. Demographic information included parental smoking history, presence of carpets in the home, number of siblings, parental history of atopic diseases, and socioeconomic status. Information on childhood wheeze, eczema, allergic rhinitis, illnesses, contact with medical professionals, and medications was collected monthly from birth to 15 months; at 18 months; and at 2, 7, and 12 years. Skin-prick tests to food and environmental allergens were performed once on parents and in children at ages 2, 7, and 12 years. The exposure variables were defined as questionnaire response at birth and at 7 and 12 years. Multiple logistic regression analyses were used to investigate associations while adjusting for confounders. The exposure variables were the presence of cat controlled for dog, dog controlled for cat, or either a cat or dog at birth.

RESULTS. Exposure to cats or dogs at birth did not reveal a statistically significant effect on development of allergic disease. There was a trend toward reduction in risk of wheeze (adjusted odds ratio = 0.76; 95% confidence interval: 0.53–1.09) and allergic rhinitis (adjusted odds ratio = 0.71; 95% confidence interval: 0.49–1.02) after 7 years. Protective effects were stronger in children of cat-sensitized fathers had a higher rate of allergic disease than children of fathers who were not allergic to cat or grass. Children of cat-sensitized fathers had a higher rate of allergic disease if an animal was present in the home at birth.

CONCLUSIONS. Cat or dog exposure at birth either decreased or had no effect on allergic disease in most children up to age 12.

REVIEWER COMMENTS. The effect of pets at birth and in early childhood on allergic disease in children is of great interest to parents. Studies have been conflicting. The current study provides longer follow-up than many previous studies, but limitations include a broad definition of allergic disease and limited allergy testing. Overall, this study provides reassurance that a family history of allergic disease does not increase the likelihood of developing allergies with prenatal exposure to animals. For many patient populations, the risk of developing allergic disease may be diminished. However, in families with a parent with known cat allergy, the risk of future allergies in offspring may be higher if a pet is in the home. Although we would not recommend that a family obtain a pet with the goal of allergy risk reduction in children, keeping a cat in the home should not be harmful in most cases and may be helpful in some. Parents with known pet allergy should keep animals outside the home for the sake of sensitized parents and unborn children.

Use of Antibiotics During Pregnancy Increases the Risk of Asthma in Early Childhood

PURPOSE OF THE STUDY. To investigate whether maternal use of antibiotics during pregnancy influences the development of asthma and eczema early in life.

STUDY POPULATION. The Copenhagen Prospective Study on Asthma in Childhood (COPSAC), a birth cohort of 411 infants born between 1998 and 2001 to mothers with a history of asthma. The COPSAC data were supplemented by data from the Danish National Birth Cohort (DNBC) consisting of 101 042 pregnant women and their children recruited between 1997 and 2003. Both cohorts were followed prospectively for 5 years.

METHODS. History of maternal exposure to antibiotics in the third trimester was obtained during the first COPSAC enrollment visit. Asthma exacerbations were defined as need for oral prednisolone, high-dose inhaled corticosteroids (ICS), or asthma hospitalization. In the DNBC data, investigators defined maternal antibiotic use as at least 1 filled antibiotic prescription during pregnancy. Asthma was defined as either an asthma hospitalization or an ICS prescription filled at least once.

RESULTS. In the COPSAC birth cohort, children of mothers who used antibiotics during the third trimester were at a significantly increased risk of developing early asthma exacerbation (hazard ratio [HR]: 1.98). Maternal use of antibiotics in the third trimester did not influence the child’s risk of eczema. An increased risk of asthma after maternal antibiotic exposure was confirmed via DNBC analysis: children of mothers exposed to antibiotics during pregnancy were at a higher risk of asthma hospitalization (HR: 1.17).
and ICS use (HR: 1.18). For each additional antibiotic prescription filled during pregnancy, a progressively increased risk of asthma was demonstrated (adjusted $P = .01$).

CONCLUSIONS. An increased risk of asthma was found in a prospectively followed cohort of children whose mothers received antibiotics during the third trimester of pregnancy. This finding was confirmed in an unselected national birth cohort of mothers. No increased risk of eczema was detected in either cohort.

REVIEWER COMMENTS. Perturbing the native microbiome in the lungs has been increasingly shown to affect both asthma development and clinical control. This study adds to the mounting evidence suggesting that changing the balance between beneficial and pathogenic bacteria may play a role in the development of asthma. In a prospective analysis, these investigators implicate in utero exposure to maternal antibiotics as a significant risk factor in early asthma pathogenesis.

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The Impact of Birth Mode of Delivery on Childhood Asthma and Allergic Diseases—a Sibling Study

PURPOSE OF THE STUDY. To investigate if cesarean delivery (CD) increases the risk of asthma in childhood and adolescence.

STUDY POPULATION. The study population consisted of a cohort of 87,555 Swedish siblings (175,110 children).

METHODS. This register-based cohort study linked the study population to the Swedish Prescribed Drug Register and the National Patient Data Register. These databases contain prescriptions and inpatient and outpatient visit diagnoses for the majority of the study period. Asthma outcome variables, including medication and asthma diagnosis, were collected at the 10th or 13th year of life (age 10 for children born June 1993 through June 1999 or age 13 for children born June 1993 through May 1996). Diagnostic criteria included a prescription for any asthma medication except for oral β2-agonists dispensed at least twice during the year of follow-up or diagnosis of asthma in the National Patient Data Register. CD was defined as elective if performed before the onset of labor and as emergency after the onset of labor. Data were adjusted for maternal and child characteristics to include child gender, birth weight, gestational age, birth order, hypoxia/asphyxia at birth, Apgar score, maternal age, parental cohabitation, maternal birth country, and maternal BMI.

RESULTS. Of the 87,555 sibling pairs studied, 20,493 had discordant modes of delivery in which 1 sibling was delivered vaginally (VD) and 1 by CD, 1005 were discordant for use of any asthma medication, and 240 were discordant for asthma diagnosis. In cohort analyses, there was an increased risk of asthma in children born via CD compared with those born via VD. When stratified into emergency versus elective CD, emergency CD was associated with a slight increased risk of asthma medication prescription. Sibling control analyses revealed a nonsignificant association between CD and diagnosis of asthma.

CONCLUSIONS. There is an increased risk of asthma in children born by emergency but not elective CD when compared with VD. This difference is not well explained by discrepant exposure to vaginal microflora.

REVIEWER COMMENTS. The current study is novel as the first sibling control analysis on mode of delivery and asthma. The hygiene hypothesis postulates that the incidence of asthma is increasing in developed regions secondary to decreased exposure to infections, parasites, and noninfectious microorganisms. Without stimulation of infectious disease, the immune system switches from an infection-fighting (Th1) profile to an allergy/asthma-producing (Th2) profile. It has been postulated that children born by CD do not come in contact with vaginal microflora and therefore are more likely to develop a Th2 profile, predisposing them to asthma and other allergic diseases. Based on results of the current study, it is unlikely that exposure to vaginal microflora causes reduced risk of asthma. Results of the current study suggest that maternal/fetal characteristics or indications for CD play a role in subsequent childhood asthma risk.

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Prenatal and Postnatal Bisphenol A Exposure and Asthma Development Among Inner-City Children

PURPOSE OF THE STUDY. Mouse models suggest that bisphenol A (BPA), which is widely used in manufacturing of food container linings, may increase allergic inflammation. Authors of this study sought to investigate whether BPA exposure would be associated with increased odds of developing wheeze and asthma.

STUDY POPULATION. Between 1998 and 2006, 568 pregnant women were recruited from prenatal clinics. The women were of African American and Dominican ethnicity, aged...
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