Allergy

PREDICTION, PREVENTION, AND THE “HYGIENE HYPOTHESIS”

Allergen Exposure in Infancy and the Development of Sensitization, Wheeze, and Asthma at 4 Years


PURPOSE OF THE STUDY. To determine to what extent allergen exposure in infancy (3 months old) leads to sensitization, wheeze, and physician-diagnosed asthma at 4 years of age.

STUDY POPULATION. This study is of a subsample of a prospective birth cohort (n = 4146 children) recruited in the Netherlands. Subjects were children (n = 1127) classified as high risk (n = 464, atopic mother) and low risk (n = 663, nonatopic mother).

METHODS. Mothers were identified during pregnancy as atopic or nonatopic using a validated screening questionnaire on asthma and inhalant allergies. Children were recruited on the basis of high-risk (atopic mothers) and low-risk (nonatopic mothers) for close follow-up including a home visit at 3 months of age and a medical examination at 4 years of age. At the home visit, dust samples were collected from the child’s mattress and analyzed for house dust mite (Der p 1), cat (Fel d 1), and dog (Can f 1) with samples adjusted for season of collection. At 4 years of age, blood samples were drawn for specific IgE levels to inhalant allergens. Data on demographic factors, respiratory symptoms, and risk factors for asthma were collected by yearly questionnaires. Participants were assessed and placed into a diagnostic category: never wheeze, early transient wheeze (at least 1 episode of wheeze within 3 years of life and no wheeze during fourth year), late-onset wheeze (no wheeze in first 3 years of life and at least 1 in fourth year), persistent wheeze (1 episode of wheeze in the first 3 years of life and at least 1 episode in the fourth year), and physician-diagnosed asthma.

RESULTS. Allergen sensitization was noted to dust mite, cat, or dog allergens in 14%, 7%, and 4%, respectively. Transient wheeze was noted among 24% and persistent wheeze among 11% of participants, with 4% having physician-diagnosed asthma at 4 years. Allergen exposure was less than detection limits for 42%, 13%, and 68% to Der p 1, Fel d 1, and Can f 1, respectively, with no significant differences between the children of non-atopic and atopic mothers. Of those with allergen exposure, only exposure to house dust mite and cat allergen were found to increase the risk of sensitization at 4 years (odds ratio: 3.22, P = .01; and odds ratio: 2.60, P = .06, respectively). Exposure to allergens was not found to be significantly associated with early transient wheeze. There was an association between cat allergen and persistent wheeze (odds ratio: 2.22; P = .11). Children of atopic mothers, there was a positive association between mite exposure and diagnosed asthma. In children of nonatopic mothers, there was a positive association between dog dander exposure and persistent wheeze. Overall, allergen exposure was not highly associated with physician-diagnosed asthma; however, in children with atopic mothers, dust mite exposure was associated with asthma diagnosis (odds ratio: 3.52; P = .07).

CONCLUSIONS. The association between allergen exposure and sensitization was demonstrated for dust mite and cat allergens at 4 years. Cat allergen exposure and sensitization were associated with persistent wheeze. Early mite and dog allergen exposure might lead to asthma and persistent wheeze in subgroups defined by maternal atopy.

REVIEWER COMMENTS. Similar to other longitudinal cohort studies, this study demonstrates an association between allergen exposure and sensitization and provides some additional evidence for the link between allergen exposure and persistent asthma. Long-term follow-up of such cohorts is necessary to help us better understand the relationship between early allergen exposure and development of atopy and asthma.

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Breast-feeding Reduces the Risk for Childhood Eczema


PURPOSE OF THE STUDY. To investigate the effect of breast-feeding in various phenotypes of eczema.

STUDY POPULATION. A birth cohort of 4089 children followed up to 4 years of age.

METHODS. Data on breastfeeding, allergic symptoms, and potential confounders were obtained from questionnaires when the children were 2 months and 1, 2, and 4 years old. At 4 years, blood allergen-specific immunoglobulin E was analyzed. Children with symptoms of eczema and asthma during the period of breastfeeding were excluded in most analyses on risk assessment of eczema and asthma, respectively, to avoid disease-related modification of exposure.

RESULTS. Exclusive breastfeeding for ≥4 months reduced the risk for eczema at the age of 4 years (odds ratio [OR]:
0.78; 95% confidence interval [CI]: 0.63–0.96) irrespective of combination with asthma, sensitization to common allergens, or parental allergic disease. This decreased risk was most evident for children with onset of eczema during the first 2 years persisting to 4 years (OR: 0.59; 95% CI: 0.45–0.77). Among children with early-onset eczema, irrespective of persistency, followed by late onset of asthma or early-onset asthma, irrespective of persistency, followed by late-onset eczema to 4 years, a protective effect of breastfeeding was also seen (OR: 0.48; 95% CI: 0.30–0.76).

CONCLUSIONS. Breastfeeding ≥4 months reduces the risk for eczema and asthma to 4 years of age.

REVIEWER COMMENTS. Many studies to date have shown that breastfeeding confers a protective effect against early atopic diseases including eczema. This is yet another argument to support breastfeeding.

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The Association of Prolonged Breastfeeding and Allergic Disease in Poor Urban Children

PURPOSE OF THE STUDY. To determine the association between allergic disease in children and prolonged breastfeeding.

STUDY POPULATION. A random sample (n = 861) of 15% of households from 2 poor suburbs of Cape Town, South Africa.

METHODS. Parents completed a validated International Study on Asthma and Allergies in Childhood questionnaire on allergic diseases for children aged 6 to 14 years. Other questions included breastfeeding duration, maternal smoking, and parental allergy. Results were adjusted for possible confounders and possible clustering within the household.

RESULTS. Of the 861 children included in the study, allergic disease in general and hay fever in particular were significantly less frequent in those with prolonged (>6 months) breastfeeding. There was a significant linear inverse association between breastfeeding duration and allergic disease in children without allergic parents but not in children with an allergic predisposition.

CONCLUSIONS. These results from a developing country suggest a protective effect of prolonged breastfeeding on the development of allergic disease, particularly hay fever, in children born to nonallergic parents. This protective effect was not found in children with an allergic predisposition.

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Infantile Eczema at One Month of Age Is Associated With Cord Blood Eosinophilia and Subsequent Development of Atopic Dermatitis and Wheezing Illness Until Two Years of Age

PURPOSE OF THE STUDY. To determine if a correlation exists between the prevalence of neonatal skin eruptions at 1 month of age and the later development of atopic dermatitis. In addition, the authors sought to determine if the presence of cord blood eosinophils correlated with the development of later skin disease.

STUDY POPULATION. One hundred five newborn infants born by normal vaginal delivery in Mitoyo General Hospital (Kagawa, Japan) from May 1987 to March 1989.

METHODS. The cord blood eosinophil count was measured at the time of delivery. The neonates were examined at 1 (all subjects) and 24 (98 subjects) months of age by a doctor who was unaware of the cord blood eosinophil count. The subjects’ histories of allergic symptoms or physician-diagnosed wheezing bronchitis or asthma during the first 8 years of life were also determined by direct examination or interviews with the guardians (67 subjects). The age of each subject at the onset of the allergic symptoms was determined. Skin eruptions at 1 month of age were classified into 4 categories: (1) infantile eczema; (2) seborrheic dermatitis; (3) intertrigo; or (4) diaper dermatitis. The diagnosis of atopic dermatitis was made according to the criteria by Hanifin and Rajka (Hanifin JM, Rajka G. Diagnostic features of atopic dermatitis. Arch Dermatol Venereol. 1980;92:44–47), and each rash was defined carefully by appearance.
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