Allergy

DIAGNOSIS

THE ATOPY PATCH TEST—REPRODUCIBILITY AND COMPARISON OF DIFFERENT EVALUATION METHODS


Purpose of the Study. Atopy patch testing (APT) has been suggested to be a valuable tool in the diagnosis of allergy. The purpose of this study was to examine the reproducibility of APT results and to compare visual evaluation to chromametry and laser Doppler imaging.

Study Population. Fifty-two patients with atopic dermatitis.

Methods. APT was performed on tape-stripped and unstripped test fields on their backs using cat dander, house dust mite, and grass pollen allergens from 2 different suppliers. Responders were retested 4 to 12 weeks later with the same allergens on their forearms.

Results. Fourteen (26.9%) volunteers showed 1 or more positive reactions. The reproducibility rate was 56.3%. The test agreement in volunteers tested with allergens from the 2 different manufacturers was poor. Correlation of the results between the three evaluation methods was significant (P < .001). Compared with chromametry and laser Doppler imaging, visual scoring was superior in differentiation between irritative and allergic reactions.

Conclusions. The low reproducibility rate of APT results and the poor inter-test-agreement using allergens from different suppliers show that much work remains to make APT a reliable tool in identifying relevant aeroallergens in patients with atopic dermatitis.

Reviewer’s Comments. APT has been proposed as a useful adjunct for the diagnosis of allergy, especially in patients with atopic dermatitis and allergic gastrointestinal disease. If perfected, the test could be of particular value for non–immunoglobulin E (IgE)-mediated conditions where skin testing and radioallergosorbent testing (RAST) will not be useful. However, as demonstrated in this study, there is still a great deal of work to be done before this test can be reliably applied to clinical practice.

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PREDICTION AND PREVENTION

ENVIRONMENTAL EXPOSURE TO ENDOTOXIN AND ITS RELATION TO ASTHMA IN SCHOOL-AGE CHILDREN


Purpose of the Study. The “hygiene hypothesis” has been proposed as a major factor underlying the rapid increase in asthma and allergy over the past 20 to 30 years. This purpose of this study was to investigate whether exposure to microbial products in early life had any effect on the future development of asthma or allergy.

Study Population. Eight hundred twelve children between the ages of 6 and 13 years living in rural areas of Germany, Austria, and Switzerland where there were both farming and nonfarming households.

Methods. Parents completed a standardized questionnaire on asthma and hay fever. Blood samples were obtained from the children and tested for atopic sensitization; peripheral-blood leukocytes were also harvested from the samples for testing. The levels of endotoxin in the bedding used by these children were examined in relation to clinical findings and to the cytokine-production profiles of peripheral-blood leukocytes that had been stimulated with lipopolysaccharide and staphylococcal enterotoxin B.

Results. Endotoxin levels in samples of dust from the children’s mattress were inversely related to the occurrence of hay fever, atopic asthma, and atopic sensitization. Nonatopic wheeze was not significantly associated with endotoxin levels. Cytokine production by leukocytes (production of tumor necrosis factor-α, interferon-γ, interleukin-10, and interleukin-12) was inversely related to the endotoxin level in the bedding, indicating a marked down-regulation of immune responses in exposed children.

Conclusions. A child’s environmental exposure to endotoxin may have a crucial role in the development of tolerance to ubiquitous allergens found in natural environments.

Reviewer’s Comments. This is a fascinating study on a timely and important topic. Although the final answer on the hygiene hypothesis is still far from complete, this is another piece of evidence in support of this theory.

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EFFECT OF EXCLUSIVE BREAST-FEEDING AND EARLY SOLID FOOD AVOIDANCE ON THE INCIDENCE OF ATOPIC DERMATITIS IN HIGH-RISK INFANTS AT 1 YEAR OF AGE


Purpose of the Study. To evaluate whether there is a preventive effect of exclusive breastfeeding and early solid food avoidance on the incidence of atopic dermatitis (AD). Sensitization to milk and egg allergens were also considered as secondary endpoints.

Study Population. A total of 1121 healthy newborn infants with a family history of atopy recruited from maternity wards who were exclusively breastfed or received cow’s milk formula (CMF) during the first 16 weeks of life.

Methods. This was a prospective cohort study comparing the incidence of AD in the first year of life between infants who were exclusively breastfed and infants who were exclusively or supplementarily formula-fed with CMF during the first 16 weeks of life. The effect of early solid food avoidance in the incidence of AD was evaluated as well as the incidence of egg and milk sensitization. At study entry, mothers were encouraged to exclusively breastfeed for at least 4 months, and solid foods were discouraged during this same time period. If breastfeeding was not possible, difficult, or refused, infants received formula exclusively or as a supplement. The mothers recorded weekly dietary diaries during the first 24 weeks of life. Mothers were asked to record the type of milk, time of introduction of milk, and types of foods consumed during this time period. Infants were seen by a physician at 1, 4, 8, and 12 months or between visits if skin lesions were observed and suspicious for AD. Blood was obtained at birth, 4 months, and 12 months for total immunoglobulin E (IgE) and specific IgE for milk and egg allergens.

Results. Eight hundred sixty-five infants were exclusively breastfed and 256 received CMF during the study period. There were significant differences between the 2
study groups. The breastfed group had significantly higher atopic risk based on family history, higher level of parental education, less maternal postnatal smoking and lower prevalence of pets in the home. At 1 year, 9.5% of the breastfed group and 14.8 of the CMF group had AD ($P = .015$). Age at first introduction of solids or diversity of foods given in the first 24 weeks did not seem to affect the incidence of AD. There was no difference between groups for milk or egg sensitization; however, infants with AD were more likely to be sensitized (4 times for milk and 8 times for egg) than those without AD. Risk factors for AD included increased number of core family members with AD, double atopic risk (both parents) and cord blood IgE levels above detection (0.35 kU/L). Participants with pets in the home had a significantly lower incidence of AD than those without pets.

Conclusions. Despite higher atopic risk, the incidence of atopic dermatitis was significantly lower in infants exclusively breastfed during the first 16 weeks of life as compared with infants receiving CMF during this same time period. Neither the age at first introduction of solids nor the diversity of solids fed during the first 16 weeks seemed to increase the incidence of AD.

Reviewers’ Comments. Breastfeeding is widely accepted as the ideal source of nutrition for newborn infants, and the current study provides evidence that exclusive breastfeeding for the first 4 months of life may reduce the risk of AD in individuals with high atopic risk. As observed in this study, mothers of infants with a history of atopy were more likely to breastfeed exclusively, creating a significant difference between groups at baseline. Therefore, the protective effect of exclusive breastfeeding may not be applicable to the general population. Delay of the introduction of solids did not affect the incidence of AD in the current study. All participants received detailed information regarding the benefits of delayed solid food avoidance and avoidance of highly allergenic foods; therefore, the percentage of infants fed solids and diversity of foods received during the study period was low in both groups. Significant differences may have been observed between groups in both the incidence of AD and sensitization to milk and egg if the percentage of infants receiving solids was higher or more allergenic foods were introduced. Future prospective studies should be conducted to evaluate the long-term preventive effects of breastfeeding beyond 4 months of life, particularly in atopic populations.

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LONG-TERM RELATION BETWEEN BREASTFEEDING AND DEVELOPMENT OF ATOPY AND ASTHMA IN CHILDREN AND YOUNG ADULTS: A LONGITUDINAL STUDY


Purpose of the Study. To assess the relationship between breastfeeding and the long-term outcomes of atopy and asthma.

Study Population. One thousand thirty-seven children from a cohort of 1661 born in Dunedin, New Zealand, between April 1972 and March 1973 and residing in the Otago province of New Zealand at 3 years of age.

Methods. Breastfeeding history was obtained independently via interviews when the children were 3 years old. Participants were assessed within 1 month of their birthday at ages 3, 5, 7, 9, 11, 13, 15, 18, 21, and 26 years. In addition to interviews and respiratory questionnaires, every 2 to 5 years from ages 9 to 26 years, participants had pulmonary function, bronchial challenge, and allergy skin tests performed.

Results. Five hundred four (49%) children were breastfed for 4 weeks or longer and 533 (51%) children were not breastfed. More children who were breastfed were atopic to cats, house dust mites, and grass pollen from ages 13 to 21 years than those who were not breastfed. More children who were breastfed reported current asthma at assessments from 9 to 26 years than those who were not breastfed. The effects of breastfeeding were not affected by parental history of allergic rhinitis or asthma, socioeconomic status, parental smoking, birth order, or the use of sheepskin bedding during infancy.

Conclusions. Breastfeeding is not protective against atopy and asthma in the long-term.

Reviewers’ Comments. Previous studies have yielded conflicting results regarding the effects of breastfeeding on the development of atopy and asthma. Although many studies have shown effects in the first 2 to 3 years of life, fewer have demonstrated any long-term benefit. This suggests that these effects, if any, are transient and serve more to delay than to truly prevent the development of allergy or asthma.

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EXPOSURE TO DOGS AND CATS IN THE FIRST YEAR OF LIFE AND RISK OF ALLERGIC SENSITIZATION AT 6 TO 7 YEARS OF AGE

Ownby DR, Johnson CC, Peterson EL. JAMA. 2002;288: 963–972

Purpose of the Study. To determine if there is an association between pet exposure in the first year of life and allergy sensitization at age 6 to 7 years.

Study Population. A prospective birth cohort enrolled from a health maintenance origination in suburban Detroit. Enrolled infants were born between 1987–1989, and followed yearly through age 7 years. Of the 835 enrolled infants, 474 completed the protocol.

Methods. After enrollment, families were interviewed for allergic histories. At age 1, the parents were contacted, and the number and type of pet(s) in the home in the first year was determined. That number of cats and dogs was used as the reference for the study. At ages 2 and 4 a home visit for dust mite and cat dust samples was performed. Phone visits were done at ages 3, 5, and 6. At 6 to 7 years skin tests for allergens, serum immunoglobulin E (IgE), radioallergosorbent testing (RAST), asthma histories and medication use, pulmonary function, and methacholine challenges were done. The results were tested to determine if any of the three levels of pet exposure affected any allergic and/or asthmatic condition: 0 pets, 1 dog or cats, 2 or more dogs or cats.

Results. Using either skin test or RAST as a measure of atopy, there was a protective effect for developing atopy at age 6 to 7 years as the level of exposure of dogs increased (≥2 dogs more protective than 1 dog). Asthma development was not attenuated by dog exposure. As the number of dogs and cats increased, the development of atopy to indoor and/or outdoor allergens decreased; however, asthma did not decrease. The exposure to pets at age 6 or 7 had no influence on the findings.

Reviewer’s Comments. Few studies have raised as many questions from both patients and physicians as has this
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