Allergy

RISK FACTORS, PREVENTION AND THE HYGIENE HYPOTHESIS

Relationship Between Prenatal and Postnatal Exposures to Folate and Risks of Allergic and Respiratory Diseases in Early Childhood


PURPOSE OF THE STUDY. To evaluate the relationship between maternal folate exposure and the development of allergic and respiratory disease in early childhood.

STUDY POPULATION. The study group included 917 pregnant women-child pairs from the Mothers and Children’s Environmental Health study in South Korea. Exclusion criteria included gestational age <37 weeks, pregnancy complications including hypertension, gestational diabetes, intraterine growth retardation, twins, or congenital anomaly.

METHODS. Maternal dietary intake was assessed by questionnaire. Maternal serum folate levels were prospectively measured during mid- and late pregnancy and categorized as high or low relative a median value. Atopic markers (serum total immunoglobulin E, eosinophil count, interleukin-10) and folate levels were measured in cord blood (CB) and in children at 24 months old and analyzed as high or low relative to a median value. Atopic dermatitis (AD), asthma, and lower respiratory tract infections (LRTI) were assessed via a questionnaire at 6, 12, and 24 months of age.

RESULTS. High folate levels in midpregnancy were associated with lower risk for increased CB eosinophil count, and high folate levels in mid- and late pregnancy were more associated with high CB interleukin-10. There was no significant association between folate levels in mid- or late pregnancy and child biomarker levels at 24 months of age. High folate levels in midpregnancy were associated with decreased risk of AD in children at 24 months but not at 6 and 12 months of age. Similarly, a decreased risk of LRTIs in children at 6 months of age was observed in the high-folate group at midpregnancy, after adjusting for maternal age, BMI, atopic history, urinary cotinine levels, infant’s gender, gestational age, and breastfeeding. There was no association between folate levels in the children and the prevalence of AD or LRTIs.

CONCLUSIONS. High maternal serum folate levels in midpregnancy were associated with a decreased risk of LRTIs and AD in early childhood, but there is a conflicting association with atopic biomarkers.

REVIEWER COMMENTS. There have been inconsistent reports about folic acid supplementation in pregnancy and the risk for LRTIs and atopic disease. This study suggests that the timing of maternal folate supplementation (mid- vs late pregnancy) may affect development of allergic disease and LRTIs in early childhood. The strengths of this study include adjustment for variables such as history of atopy and breastfeeding as well as its prospective nature. However, weaknesses include recall bias, subjective report of atopic diagnosis, the short study period, and exclusion of asthma, another allergic disease, due to low statistical power. The authors also did not address optimal dosing of folic acid and folate level during pregnancy given that this may also affect outcomes.

URL: www.pediatrics.org/cgi/doi/10.1542/peds.2015–2776E

Gina T. Coscia, MD
Joyce E. Yu, MD
New York, NY

Differential Effects of Two Probiotics on the Risks of Eczema and Atopy Associated With Single Nucleotide Polymorphisms to Toll-Like Receptors


PURPOSE OF THE STUDY. The purpose of this study was to determine if probiotic supplementation could modify the genetic predisposition to eczema based on toll-like receptor (TLR) gene variants in an at-risk infant population.

STUDY POPULATION. The study was a double-blind, randomized, placebo-controlled trial of 331 term infants with a paternal history of treated asthma, eczema, or hay fever.

METHODS. Pregnant women were given daily supplementation with Lactobacillus rhamnosus strain HN001, Bifidobacterium animalis subsp. lactis strain HN019, or placebo from 35 weeks’ gestation until birth. Breastfeeding mothers continued supplementation until 6 months of age, and all infants received daily supplementation until 2 years of age. Outcomes included development of eczema at multiple time points during the first 6 years of life, eczema severity (using SCORing Atopic Dermatitis; SCORAD), and identification of single nucleotide polymorphisms (SNPs) in TLR genes that were associated with increased risk of atopy, eczema, and SCORAD ≥10. Response to supplementation with HN001 and HN019 was also assessed.

RESULTS. Of the 311 subjects, 114 received HN019, 108 HN001, and 106 placebo. At the end of the study, 44% of HN019, 38% of HN001, and 48% of placebo subjects developed eczema (SCORAD ≥10). Fifty-four SNPs were selected for genotyping with identification of 10 variants that were significantly associated with atopy, 9 with eczema, and 8 with SCORAD ≥10. In subjects who received HN001, 20 SNPs were significantly associated with decreased risk of atopy, 26 with reduction of
eczema development, and 18 with decreased risk of SCORAD ≥10. Three of these variants were associated with a significant risk reduction in all 3 variables. Only 2 variants provided similar risk reductions in those who received HN019.

CONCLUSIONS. This study found that supplementation with Lactobacillus rhamnosus strain HN001 could reduce the risk of atopy and eczema development in subjects with TLR genetic variants typically associated with a higher risk of these diseases.

REVIEWER COMMENTS. This study highlights the growing interest in the use of probiotics for the prevention and treatment of atopic disorders. Several studies have shown reduction in eczema risk, but the mechanism in which probiotics accomplish this has been unknown. The authors demonstrate the role of probiotic interaction with TLR SNP variants, identifying a novel mechanism through which risk reduction occurs. The study also suggests that this intervention should begin early, during pregnancy, to have significant benefit.

REF: www.pediatrics.org/cgi/doi/10.1542/peds.2015-2776F

Ashley N. Stoner, MD
Robert Pesek, MD
Little Rock, AR

Maternal Consumption of Dairy Products, Calcium, and Vitamin D During Pregnancy and Infantile Allergic Disorders

PURPOSE OF THE STUDY. To assess the effect of maternal consumption during pregnancy of dairy foods, calcium, and vitamin D on allergic disorders in Japanese children aged 23 to 29 months.


METHODS. Data were obtained using the Kyushu Okinawa Maternal and Child Health Study (KOMCHS), a prospective prebirth cohort study. Participants returned the application form and questionnaires were obtained from patients at obstetric hospitals in Okinawa. Diet history of maternal intake was assessed from April 2007 to March 2008. The questionnaire, completed by the mother, also elicited maternal and paternal history of asthma, atopic dermatitis, and allergic rhinitis.

RESULTS. Infants with mothers in the highest quartile for dairy product ingestion during pregnancy had a significantly reduced risk of infantile eczema. A reduced risk of physician-diagnosed infantile asthma was significantly associated with higher maternal intake of cheese during pregnancy. Among mothers with yogurt and calcium consumption during pregnancy, physician-diagnosed infantile atopic dermatitis was found to be significantly inversely diagnosed. Increased risk of eczema was seen among mothers with high Vitamin D intake during pregnancy.

CONCLUSIONS. Among offspring of mothers with high intake of total dairy products, cheese, yogurt, and calcium during pregnancy, the risk of infantile eczema, physician-diagnosed asthma, and physician-diagnosed atopic eczema may be reduced. There may be an increased risk of infantile eczema associated with higher maternal intake of vitamin D during pregnancy.

REVIEWER COMMENTS. Interest in the use of supplements and possible effects on atopy is growing. The significance of exposure during gestation is important in the long-term health of children, as seen in this study. This study raises interesting questions regarding exposure to foods via maternal intake during gestation and later development of atopic disease. Because the use of vitamin D supplementation is increasing, the authors remind us that there may be a risk of infantile eczema, and therefore further studies are warranted.

REF: www.pediatrics.org/cgi/doi/10.1542/peds.2015-2776G

Grace T. Padron, MD
Vivian Hernandez-Trujillo, MD
Miami, FL

Cesarean Section and Chronic Immune Disorders

PURPOSE OF THE STUDY. This study was designed to investigate the cesarean mode of delivery as a possible risk factor for the development of several chronic immune disorders.

STUDY POPULATION. All full-term children born between January 1973 through January 1, 2012, were identified through the Danish Medical Birth Registry. Two and a half million children were born in the selected period (1973–2012), and after excluding preterm births, stillbirths, births to mothers born before 1952, and individuals with missing data, 1.9 million children were included in the analysis.

METHODS. The authors compared cesarean versus vaginal delivery and the incidence of selected immune-mediated diseases: asthma, systemic connective tissue disorders, juvenile arthritis, inflammatory bowel disease (IBD), diabetes type 1, immunodeficiencies, celiac disease, leukemia, and psoriasis. Forearm or elbow fractures were used as negative control conditions. Confounding variables were chosen a priori as gender, parity, birth weight, attained age, calendar time (3-year groups), season of birth, maternal age, and maternal illness (eg, maternal diagnosis of the disease in question).

REF: www.pediatrics.org/cgi/doi/10.1542/peds.2015-98
Differential Effects of Two Probiotics on the Risks of Eczema and Atopy Associated With Single Nucleotide Polymorphisms to Toll-Like Receptors
Ashley N. Stoner and Robert Pesek
Pediatrics 2015;136;S223
DOI: 10.1542/peds.2015-2776F

Updated Information & Services
including high resolution figures, can be found at:
http://pediatrics.aappublications.org/content/136/Supplement_3/S223.2

Permissions & Licensing
Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:
https://shop.aap.org/licensing-permissions/

Reprints
Information about ordering reprints can be found online:
http://classic.pediatrics.aappublications.org/content/reprints
Differential Effects of Two Probiotics on the Risks of Eczema and Atopy Associated With Single Nucleotide Polymorphisms to Toll-Like Receptors
Ashley N. Stoner and Robert Pesek
*Pediatrics* 2015;136;S223
DOI: 10.1542/peds.2015-2776F

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://pediatrics.aappublications.org/content/136/Supplement_3/S223.2