Prenatal and Postnatal Probiotics Reduces Maternal but Not Childhood Allergic Diseases: A Randomized, Double-Blind, Placebo-Controlled Trial


PURPOSE OF THE STUDY. To evaluate the prevalence of allergen sensitization and development of allergic diseases in high-risk infants following prenatal and postnatal probiotic supplementation.

STUDY POPULATION. The study population included 191 pregnant women with atopic diseases determined by history, total immunoglobulin E (IgE) concentration >100 kU/L, and/or positive specific IgE concentration >0.7 kU/L for at least 1 of the following: Dermatophagoides pteronyssinus, cockroach, egg white, milk protein, shrimp, or peanut.

METHODS. Pregnant mothers were assigned to receive Lactobacillus GG (LGG) or placebo, daily, from 24 weeks’ gestation until delivery. After delivery, breastfeeding mothers and non-breastfeeding infants received LGG for 6 months. Questionnaires regarding allergic symptoms, total IgE levels, and allergen-specific IgE levels were obtained in mothers at enrollment and delivery. Clinical assessments, total IgE levels, and allergen-specific IgE levels were obtained in children at 0 (cord blood), 6, 18, and 36 months of age. Primary outcome measures assessed point and cumulative prevalence for allergic symptoms and diseases in children with allergic sensitization and IgE-associated diseases at 6, 18, and 36 months. Paired studies of cytokine profiles before and after LGG administration were assessed for interleukin (IL)-10, IL-13, IL-12p70, interferon-γ, inducible protein-10, and transforming growth factor-β.

RESULTS. No significant effects of probiotic supplementation on allergic sensitization in children, development of allergic diseases in children, or maternal IgE levels were found. Maternal symptoms of allergic rhinitis improved in 60% of the LGG group and 34% of the placebo group. No symptomatic improvement of gastrointestinal allergy or eczema was demonstrated. Maternal allergic symptom improvement was most prominent in women with initial total IgE >100 kU/L. Symptom improvement was associated with increased IL-12p70 levels, irrespective of LGG or placebo administration.

CONCLUSIONS. Administration of LGG from 24 weeks’ gestation reduced severity of maternal atopy but did not prevent childhood sensitization or allergic disease. Increases in IL-12p70 levels in mothers with clinical improvement suggest that LGG improved maternal atopy by enhancing T helper 1 cell expression rather than decreasing IgE production.

Pre- and Postnatal Lactobacillus reuteri Supplementation Decreases Allergy Responsiveness in Infancy


PURPOSE OF THE STUDY. Probiotic supplementation has been shown in some studies to decrease the development and incidence of atopic dermatitis and allergic sensitization. This study sought to identify the immunomodulatory effect of prenatal and postnatal Lactobacillus reuteri supplementation.

STUDY POPULATION. Sixty-one children from a double-blind, randomized, placebo-controlled probiotic trial with available blood cell samples from at least 3 time-points, including birth and 6, 12, or 24 months. Twenty-nine children received probiotic supplementation from 36 weeks through 12 months of age and 32 received placebo.

METHODS. Peripheral blood mononuclear cells were isolated from blood samples and challenged with ovalbumin, birch, cat, or phytohaemagglutinin. Interleukin (IL)-5, IL-10, IL-13, interferon-γ, CCL17, CCL18, CCL22, and CXCL10 were measured. The effect of probiotics on T helper cell differentiation was indirectly explored.

RESULTS. Probiotic supplementation decreased mean allergen-induced production of several cytokines at several time periods, particularly IL-5 and IL-10. Differences were most significant for cat. Children with IgE-associated disease had predictably higher levels of birch-induced CCL17 at 12 and 24 months of age, as well as higher ovalbumin-induced CXCL10 at birth and CCL17 at age 24 months. Analysis showed that the observed difference...
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