Study Population. The Promotion of Breastfeeding Intervention Trial (PROBIT) is a birth cohort of 17,046 healthy, term infants enrolled from 31 maternity hospitals in the Republic of Belarus. Of this group, 13,889 (81.5%) had a follow-up evaluation at 6 years of age.

Methods. The maternity hospitals were randomly assigned to the intervention or control group. The intervention hospitals adopted the infant-friendly initiative, which was developed by the World Health Organization and the United Nations Children’s Fund to promote and support breastfeeding, particularly among mothers who have chosen to start breastfeeding. The control hospitals continued the practices that were already in place. At follow-up at 6 years of age, subjects were evaluated for allergic symptoms and diagnoses by using the International Study of Asthma and Allergy in Childhood (ISAAC) questionnaire and underwent skin-prick allergy tests.

Results. The intervention led to an increase in duration of any breastfeeding as measured at 3, 6, 9, and 12 months of age. In addition, the prevalence of exclusive breastfeeding was higher in the intervention group at 3 months (43.3% vs 6.4%; \( P < .001 \)) and 6 months (7.9% vs 0.6%; \( P = .01 \)). At follow-up at 6 years of age, there were no differences found between the 2 groups for rates of atopic illness such as wheezing, asthma, hay fever, and eczema. In addition, there were no differences between the groups for the rates of positive skin-prick test results. Additional analysis, after the exclusion of 6 sites (3 experimental and 3 control) with suspiciously high rates of positive skin-prick test results, demonstrated significantly higher rates of positive skin-prick test results for those in the intervention group.

Conclusions. These results indicate that promoting breastfeeding did not reduce the risk of atopic illnesses at 6 years of age despite large increases in the duration and exclusivity of breastfeeding.

Reviewer Comments. Rates of pediatric atopic illnesses have increased in industrialized countries over the past several decades. Many studies have searched for reasons that explain this rise and ways to reverse the current trend. The PROBIT study group has focused on the association between breastfeeding and subsequent risk of asthma and other allergic diseases. Previous studies on this topic have demonstrated conflicting results. This study discovered that, despite large increases in the duration of breastfeeding, there was not a reduction in the risk of asthma, hay fever, eczema, or Aeroallergen sensitivity. The researchers concluded that public health measures to increase breastfeeding are unlikely to assist in the reduction of atopic diseases. The authors acknowledged that one of the limitations of the study was the relatively low rates of allergic diagnoses among children in the study group. For example, the rates of asthma (1.2%), hay fever (4.6%), and eczema (1.0%) in the PROBIT children were lower than those generally seen in Western industrialized countries. Therefore, it may be difficult to extrapolate these results to countries in which atopic disease occurs more frequently.

Effect of Breastfeeding on Lung Function in Childhood and Modulation by Maternal Asthma and Atopy

Guilbert TW, Stern DA, Morgan WJ, Martinez FD, Wright AL. Am J Respir Crit Care Med. 2007;176(9):843–848

Purpose of the Study. Breastfeeding and its relationship to the development of subsequent asthma remain controversial. To clarify these complex issues, this study examined the association between lung function and infant-feeding practices.

Study Population. A population-based cohort of healthy infants was enrolled at birth in the Children’s Respiratory Study in Tucson, Arizona (\( n = 1246 \)); the analysis was of 679 study participants on whom lung-function testing was performed at ages 11 and/or 16 years and provided data regarding infant-feeding practices.

Methods. In the Children’s Respiratory Study in Tucson, feeding practices were assessed prospectively on the basis of questionnaires completed at enrollment and well-child visits. Formula introduction was categorized as having occurred before 2 months (\( n = 143, \text{“early formula introduction”} \)), from 2 to before 4 months (\( n = 336 \)), or at ≥4 months (\( n = 200, \text{“longer breastfed”} \)). Lung function was measured at ages 11 and 16 years. A random-effects model was used to assess the relationship of infant-feeding practices to measures of lung function.

Results. Forced vital capacity (FVC) by age 16 was increased by 103 ± 40 mL (\( P = .01 \)), and the forced expiratory volume in 1 second (FEV₁)/FVC ratio was lower (−1.9 ± 0.6%; \( P = .004 \)) in the longer-breastfed children compared with children with early formula introduction. This effect was modified after stratifying according to maternal asthma. Compared with children with early formula introduction, longer-breastfed children with asthmatic mothers had an FVC that was not increased (\( P = .7 \)) and an FEV₁/FVC ratio (−5.7 ± 2.4%; \( P = .02 \)) that was significantly decreased by age 16. Longer-breastfed children with nonastopic, nonasthmatic mothers demonstrated an increased FVC (142 ± 71 mL; \( P = .047 \)) and no decrease in FEV₁/FVC (\( P = .7 \)) compared with children with early formula introduction.
CONCLUSIONS. Longer duration of breastfeeding favorably influences lung growth in children. However, in the presence of maternal asthma, longer breastfeeding is associated with decreased airflows.

REVIEWER COMMENTS. There seems to be a differential effect of the relation of breastfeeding to lung function on the basis of the asthmatic background of the mother. Breastfed children with nonatopic, nonasthmatic mothers had an increased FVC and no decrease in their airflows. However, children of mothers with asthma with longer breastfeeding did not demonstrate any improvement in FVC but had a significant reduction in airflows, suggesting that the risk for increased asthma in this group may be partly a result of altered lung growth. Children with longer breastfeeding who had atopic but nonasthmatic mothers had intermediate findings, and they showed a similar increase in FVC compared with those with nonatopic, nonasthmatic mothers but a decrease in airflows similar to children with asthmatic mothers. These findings may support the speculation that the milk of mothers with atopy or asthma may differ with regard to immunologically active substances; thus, breastfeeding in these groups may have a different effect on growth and/or development of the airways. It goes without saying that the clinical significance of these findings is unknown. Human milk is uniquely suited to the feeding of infants. There are many well-documented benefits of breastfeeding. For children of nonasthmatic mothers, this study demonstrates a further benefit of breastfeeding. Additional study is needed to draw firm conclusions for other infants.

Solid Food Introduction in Relation to Eczema: Results From a Four-Year Prospective Birth Cohort Study

PURPOSE OF THE STUDY. To assess the association between the introduction of solid foods in the first 12 months and the occurrence of eczema during the first 4 years of life in a prospective study of newborns.

METHODS. Data were taken from annually administered questionnaires from a large birth cohort (recruited 1995–1998) comprising an intervention and a nonintervention group. Outcomes were doctor-diagnosed and symptomatic eczema. Multiple generalized estimation equation models were performed for the 2 study groups.

RESULTS. From the 5991 recruited infants, 4753 (79%) were followed up. The 2 study groups were different in their family risk of allergies and feeding practices. No association was found between the time of introduction of solids or the diversity of solids and eczema. In the nonintervention group, a decreased risk was observed for avoidance of soybean/nuts, but an increased risk was seen in doctor-diagnosed eczema for the avoidance of egg in the first year.

CONCLUSIONS. The evidence from this study supports neither a delayed introduction of solids beyond the fourth month nor a delayed introduction of the most potentially allergenic solids beyond the sixth month of life for the prevention of eczema. However, effects under more extreme conditions cannot be ruled out.

REVIEWER COMMENTS. The dilemma of when to introduce solid foods during infancy continues. The data from this investigation support the notion that it is unnecessary to delay solid foods beyond the fourth month of life or allergenic solid foods beyond the sixth month of life to prevent eczema. Specifically, this investigation found no significant effect of timing or diversity of solid foods on eczema outcomes to 4 years of age. The duration of exclusive breastfeeding as compared with the timing of introduction of solid foods, including both formulas made with whole cow’s milk or soy proteins, as well as extensively hydrolyzed casein and partially hydrolyzed whey protein formulas, were examined. It is interesting to note that findings from this investigation seem to indicate that there may be a period of immunologic immaturity during which whole protein in large amounts, whether solid or liquid, may promote the development of atopic disease. These data should help to settle the argument of when to introduce solid foods during infancy for the prevention of eczema and will have a direct impact on global recommendations dealing with this clinical issue.

Glutamine-Enriched Enteral Nutrition in Very Low-Birth-Weight Infants: Effect on the Incidence of Allergic and Infectious Diseases in the First Year of Life

PURPOSE OF THE STUDY. To determine the effect of glutamine-enriched enteral nutrition in very low birth weight infants on the incidence of allergic and infectious diseases during the first year of life. The authors hypothesized that glutamine may enhance maturation of the immune response by shifting the fetal T-helper 2 (Th2) response.
Effect of Breastfeeding on Lung Function in Childhood and Modulation by Maternal Asthma and Atopy

Todd A. Mahr

Pediatrics 2008;122;S176
DOI: 10.1542/peds.2008-2139H

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Effect of Breastfeeding on Lung Function in Childhood and Modulation by Maternal Asthma and Atopy
Todd A. Mahr
Pediatrics 2008;122;S176
DOI: 10.1542/peds.2008-2139H

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