

Breastfeeding and maternal diet in atopic dermatitis

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Abstract

Question Many children are affected by atopic dermatitis (AD) at a very young age. I often consider whether nonpharmacologic interventions could prevent or mitigate the development of AD. Do breastfeeding or changes to the maternal diet help prevent the development of childhood AD?

Answer The American Academy of Pediatrics suggests that lactating mothers with infants at high risk of developing AD should avoid peanuts and tree nuts, and should consider eliminating eggs, cow's milk, and fish from their diets. The World Health Organization also recommends breastfeeding infants up to 2 years of age. Studies have shown that breastfeeding can have a protective effect for AD in children; however, other studies have found insignificant or reversal effects. More research in this area is required.

Allaitement et alimentation maternelle en regard de la dermatite atopique

Résumé

Question De nombreux enfants sont affectés par la dermatite atopique (DA) en très bas âge. Je me demande souvent si des interventions non pharmacologiques pourraient prévenir ou atténuer le développement d'une DA. L'allaitement ou des changements dans l'alimentation maternelle aideraient-ils à prévenir le développement d'une DA infantile?

Réponse L'American Academy of Pediatrics fait valoir que les femmes qui allaitent des nourrissons à risque élevé de développer une DA devraient éviter les arachides et les noix, et envisager d'éliminer les œufs, le lait de vache et le poisson de leur alimentation. L'Organisation mondiale de la Santé recommande aussi d'allaiter les enfants jusqu'à l'âge de 2 ans. Des études ont démontré que l'allaitement pouvait avoir un effet de protection contre la DA chez l'enfant; toutefois, d'autres études ont trouvé des effets non significatifs ou inverses. Il faudrait plus de recherche à ce sujet.

Eczema, a common, chronic, relapsing inflammation of the skin, is often seen in young children.¹ Over the past 3 decades, the rate of eczema among children has increased, including the rate of atopic dermatitis (AD), one type of eczema.² Some 20% of school-aged children in North America and 10% of children in Western Europe suffer from eczema.² Similarly, incidence in other industrialized nations is about 20%.¹

There is mounting evidence that genetic linkage and family history are risk factors for developing eczema,³ and it is essential to be able to provide sound advice to families. Although food has long been thought to cause or aggravate eczema, research on prevention of AD through early nutritional intervention is lacking.

Formula feeding in young children

For many years, food has been considered a trigger for eczema, resulting in elimination diets, on occasion at the cost of malnutrition and emotional stress for children.¹ According to the American Academy of Pediatrics,

the timing of introducing solid food can also affect the development of AD.⁴ It is recommended that initiating solid food be delayed until 4 to 6 months of age, and whole cow's milk be delayed until 12 months of age.⁴

Several studies have evaluated the potential for hydrolyzed formula to reduce the risk of allergies compared with cow's milk. In a randomized double-blind trial from the German Infant Nutritional Intervention study, among more than 2000 children offered hydrolyzed formulas from birth to 1 year of age, those offered extensively hydrolyzed casein formula (odds ratio [OR] 0.42, 95% confidence interval [CI] 0.22 to 0.79) and partially hydrolyzed whey formula (OR 0.56, 95% CI 0.32 to 0.99) had significantly reduced incidence of AD compared with those offered cow's milk formula.⁵

In a Cochrane review comparing soy formula and cow's milk formula, Osborn and Sinn⁶ included 3 studies with 875 infants 0 to 6 months of age without clinical evidence of allergy or food intolerance. After comparing the effect of adapted soy formula with human milk,

cow's milk formula, and hydrolyzed protein formula on the development of atopy, they found that soy formula offered no significant benefit in preventing infant eczema (relative risk 1.20, 95% CI 0.95 to 1.52).⁶

Breastfeeding

The World Health Organization currently recommends exclusive breastfeeding for the first 6 months and continuing to breastfeed, as well as introducing other foods, until 2 years of age.⁷ Breast milk contains compounds such as α -tocopherol, β -tocopherol, and prolactin—all help degrade inflammatory compounds, increase immune function, and decrease sensitivity of infants.⁸ In a meta-analysis of 18 prospective studies from 1966 to 2002, exclusive breastfeeding during the first 3 months of life was found to reduce the incidence of AD in children with a family history of atopy (OR 0.58, CI 0.41 to 0.92) and in those without a family history of atopy (OR 0.84 for combined populations, CI 0.59 to 1.19).⁹ In another study, more than 2700 infants in the Netherlands were enrolled in a KOALA (Child, Parent, Health, Focus on Lifestyle and Predisposition) birth cohort study, in which it was found that breastfeeding could prevent atopic eczema in children.¹⁰ This study included repeated questionnaires at 34 weeks of gestation and at 3, 7, 12, and 24 months after birth, with immunoglobulin E levels measured at 2 years of age. Breastfeeding was found to prevent AD in the first 2 years of life among children of mothers without allergies and asthma.¹⁰ For mothers with allergies but no asthma, the results were not significant ($P=.14$) compared with mothers without allergies and asthma ($P=.01$), and there were no preventive effects when mothers had asthma ($P=.87$).¹⁰ Thus, it was concluded that breastfeeding had only negligible effects in children without first-order relatives who had atopy.¹⁰ In a birth cohort study conducted in Germany between 1995 and 1998, 3903 children were recruited, and exclusive breastfeeding was found to have a significant protective effect on AD prevention compared with cow's milk formula (OR 0.64, 95% CI 0.45 to 0.90).¹¹ In another prospective cohort study of healthy newborns at risk of atopy, 865 infants were exclusively breastfed and 256 infants were partially or exclusively formula fed, and were then followed for signs of AD or sensitization to milk or eggs for a year.¹² The exclusively breastfed group had a lower incidence of AD (OR 0.47, 95% CI 0.30 to 0.74). The recommendation for children with AD in the family was exclusive breastfeeding for at least 4 months to prevent AD in the first year of life.¹²

However, breastfeeding effects on AD are still controversial. In a large population-based telephone cohort study in Denmark, Benn et al reported that exclusive breastfeeding for the first 4 months actually led to an increased incidence of AD in children with parents without allergies.¹³ The association between breastfeeding

and risk of AD seemed to increase with each month of exclusive breastfeeding.¹³ However, there was no dose-response effect found when comparing exclusive breastfeeding for 6 months and 4 months.¹³ Another cross-sectional study from Japan among junior high-school students reported an increased AD incidence if children were fed breast milk in their first 3 months of infancy compared with formula ($P=.03$).¹⁴ This result was not significant among children with no parental history of allergy.¹⁴

There are 2 possible ways to explain these findings. One possible reason is maternal awareness of the risk of developing AD, thus the increased risk of AD comes from atopic heredity as opposed to the effect of breastfeeding.¹³ Another explanation is the hygiene hypothesis.¹⁴ Early infection can promote maturation of the immune system and prevent further allergies, including eczema.¹⁴ Because breastfeeding decreases the chance for children to be exposed to common allergens found in solid food or formulas, their immune systems will not be able to function properly to protect them from antigens, which might be the cause of more eczema cases found in the previous 2 studies. Although these hypotheses explain the increased incidence of AD seen in children with first-order parents with allergies, they cannot explain the increased risk of AD in children with parents without allergies.¹³

Maternal diet supplementation while breastfeeding


Can maternal dietary changes help infants avoid the risk of developing AD? In 2000, the American Academy of Pediatrics suggested that lactating mothers with infants at high risk of developing AD should avoid peanuts and tree nuts, and should consider eliminating eggs, cow's milk, and fish from their diets.¹⁵ Food allergens such as peanuts have been detected in breast milk.¹⁴ However, in a cohort study of almost 14000 preschool children, no association was demonstrated between breastfeeding and peanut allergy.¹⁶ A Cochrane review of 4 trials with 334 pregnant women did not show adequate evidence that avoidance of eggs, milk, and other antigenic food in women during lactation prevented AD in children.¹⁷ The combined evidence from these trials does not show a strong correlation between maternal antigen avoidance and the incidence of AD in the first 18 months of life (relative risk 1.01, CI 0.39 to 12.67).¹⁷ A larger sample size and a longer follow-up study are needed to determine potential outcome benefits.¹⁷

Maternal probiotic consumption during breastfeeding

Other than focusing on antigenic foods, there has been increasing interest in the effects of probiotics as a maternal dietary supplement for preventing AD in children.¹⁸

In a Norwegian study, women received probiotic supplements during the last 4 weeks of pregnancy and until 3 months after birth.¹⁸ The results showed that the administration of probiotic bacteria significantly reduced the incidence of AD among children (OR 0.51, 95% CI 0.30 to 0.87; $P = .013$).¹⁸ However, the results were not statistically significant in children with a positive family history.¹⁸ It was suggested that maternal supplementation with probiotics might influence the composition of the infant's intestinal microbial flora and that such supplementation might be a potential mechanism for increasing anti-inflammatory immunoregulatory factors in breast milk.¹⁸ Other dietary supplements undergoing research are vitamin C¹⁹ and essential fatty acids.²⁰ While there have been promising results for maternal intake of vitamin C,¹⁹ increasing the supplementation of omega-3²⁰ has not been found to reduce the incidence of AD among children.^{19,20} Further large-scale studies are required to explore these issues.^{19,20}

Conclusion

The effects of breastfeeding and maternal diet on the development of AD in children are still controversial. While some reports suggest positive effects in preventing AD by breastfeeding or changing the maternal diet, other studies show insignificant or reverse effects. Further research is needed to determine sound recommendations for families. 

Competing interests

None declared

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