



Role of Breast-feeding in the Development of Atopic Dermatitis in Early Childhood

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For all infants, breast-feeding is recommended for at least first 4 to 6 months of life.¹⁻⁴ Breast-feeding has many physiological and psychological benefits in both mothers and infants, and the World Health Organization recommends that infants be exclusively breast-fed for the first 6 months of life to achieve optimal growth development and health.⁴

The American Academy of Allergy, Asthma & Immunology and the European Academy of Allergy and Clinical Immunology recommended exclusive breast-feeding for at least 4 and up to 6 months for primary prevention of allergic disease.^{1,5} Allergy prevention through breast-feeding has been issued for more than 70 years. Many studies have investigated the role of breast-feeding in the development of allergic disease, including atopic dermatitis (AD), with inconsistent findings.

Some studies showed that breast-feeding reduces the risk for childhood AD. In a birth cohort of 4,089 children, breast-feeding for 4 months or more reduces the risk for AD and delays the onset of allergy march to age 4.⁶ A cross-sectional survey in developing countries found that prolonged breast-feeding reduces the risk of developing allergic diseases including AD even in the presence of maternal allergy.⁷ A prospective, interventional study in Belarus, 17,046 healthy mothers of full-term infants were randomly assigned to receive assistance with initiating and maintaining breast-feeding or routine postnatal follow-up. The occurrence of AD was reduced by 46 percent in infants whose mothers received breast-feeding support compared with those whose mothers did not, although the findings just reached statistical significance.⁸ A Taiwanese birth cohort study with 186 subjects reported that exclusive or partial breast-feeding for at least 6 months appears to be associated with a reduced risk of developing AD in early childhood.⁹ A systematic review with meta-analysis of 18 prospective studies evaluating the association between exclusive breast-feeding during the first 3 months after birth and AD demonstrated that exclusive breast-feeding is associated with a lower incidence of AD dur-

ing childhood in children with a family history of atopy. This effect is lessened in the general population and negligible in children without first-order atopic relatives.¹⁰ In a prospective cohort of healthy term newborns at risk of atopy, 865 infants exclusively breast-fed and 256 infants partially or exclusively formula-fed were followed up until the end of the first year, and it was found that in infants at high risk of atopy, exclusive breast-feeding for at least 4 months is effective in preventing AD in the first year of life.¹¹

In contrast, other studies did not find protective effects of breast-feeding against AD. The current issue of the AAIR, Lee *et al.*¹² investigated the association between breast-feeding and AD in young children. They analyzed 2,015 children aged 1 to 3 years from the Korea National Health and Nutrition Examination Survey. They stated that there was no association between breast-feeding and AD. They also reported that parents with allergic disease favored breast-feeding and tended to prolong breast-feeding, which is consistent with the result of other studies.¹³

An earlier study on breast-feeding and atopy in infants has yielded similar results. In a cohort of infants in south-east Sweden, the risk of AD during the first year of life was evaluated in relation to the duration of exclusive breast-feeding < 4 months. This study indicates that exclusive breast-feeding does not influence the risk of AD during the first year of life.¹⁴ A 2007 cluster randomized trial results, in which avoids the ethical issues of interfering directly with maternal choices about infant feeding, do not support a protective effect of prolonged and exclusive breast-feeding on asthma or allergy.¹⁵ A 2009 systematic re-

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Received: April 12, 2017; Accepted: April 13, 2017

• There are no financial or other issues that might lead to conflict of interest.

view and meta-analysis of prospective cohort studies in developed countries compared breast-feeding with conventional infant formula feeding or partial breast-feeding in the development of AD, and revealed that exclusive breast-feeding for at least 3 months was not significantly protective against the development of AD compared with partial breast-feeding or conventional formula.¹⁶ A birth cohort study with infants born to mothers with a history of asthma reported that no significant association between the duration of exclusive breast-feeding and the development of sensitization in the first 6 years of life. The results were adjusted for reverse causation.¹⁷

Furthermore, there have been several reports that prolonged exclusive breast-feeding may increase the risk for AD. The prevalence of AD in the first 7 years increased with each additional month of breast-feeding in an observational birth cohort study with 1,314 infants.¹³ The Auckland Birthweight Collaborative case-control study investigated risk factors for AD in babies with small for gestational age and concluded that duration of breast-feeding was associated with an increased risk of AD at the age of 3.5 years.¹⁸ A prospective 20-year follow-up study reported that exclusive breast-feeding for 9 months was associated with AD and symptoms of food hypersensitivity at the age of 5 years, and with symptoms of food hypersensitivity at the age of 11 years, in children with a family history of allergy.¹⁹ A Copenhagen birth cohort with infants who were born to mothers with a history of asthma found that breast-feeding significantly increased the risk of AD, but reduced the risk of wheezy episodes and severe wheezy exacerbation.²⁰ A Japanese study also showed that exclusively breast-fed infants were more likely to have AD than those fed formula alone. In addition, children with longer breast-feeding duration were significantly more likely to have AD.²¹ Similarly, a Korean cross-sectional study with 10,383 children aged 0-13 years reported that prolonged breast-feeding increased the risk of AD in children <5 years of age, regardless of parental history of atopic diseases.²²

Different study designs and methods may account for these discrepancies, and there should be various uncontrollable confounding factors which could not be adjusted for.²³⁻²⁵

It is important to exclude 'reverse causation,' as families with a history of allergic disease are also more likely to have breast-feeding in observational studies.¹³ Although reverse causation has been taken into account by adjusting for parental history of allergic disease, the influence of reverse causation can only be eliminated with a prospective double-blind randomized controlled trial (RCT) design. However, it is not ethically accepted to randomly divide the infants into the breast-fed and formula-fed groups. In addition, it is almost impossible to control for other various confounding factors, such as maternal immunity, maternal diet during pregnancy and lactation, breast milk composition, environment, and other lifestyles.

In summary, many studies have been conducted to evaluate the relationship between breast-feeding and allergy. The results

are inconsistent: protection against allergy, no effects, and even increased risk for allergy. The immune system in early life is greatly influenced by maternal immunity during pregnancy and lactation. Thus, further studies focusing on breast milk characteristics with well-designed RCT are needed to clarify these issues.

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