

Original article

Breast-feeding and atopic eczema dermatitis syndrome: protective or harmful?

Numerous studies have addressed the potential of breast-feeding to protect for the development of allergic diseases, and in particular of atopic eczema dermatitis syndrome (AEDS). Although the majority of studies, as well as several meta-analyses, are strongly in favour of breast-feeding, there are some conflicting results and open issues. Furthermore, breast-feeding might be detrimental in a subgroup of young infants with severe early manifestations of AEDS and immunoglobulin E sensitizations to common foods. The aim of this review is not to analyse systematically the current literature, but to suggest a scientifically and clinically based analysis of the benefits of breast-feeding in atopic infants.

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Breast-feeding has always been strongly advocated by paediatricians. There are numerous advantages in favour of breast-feeding: breast-feeding protects from infections, breast-feeding is cheap, the milk is ready to use, and it is most beneficial for building a harmonious relationship between the baby and the mother. An additional effect of breast-feeding might be to protect against atopic diseases. This topic has been addressed in numerous studies, and was recently summarized in this journal and in a meta-analysis (1,2). The aim of this review will be to discuss a selection of studies, and to draw a perspective, based not only on the literature but also on clinical considerations.

Breast-feeding and the immune system

Several immunological factors might explain the protective effect of breast-feeding on atopic diseases [reviewed in ref. (3)]. Among them, especially the presence of immunoglobulin A (IgA) antibodies in human milk could prevent antigen absorption and subsequent triggering of IgE production. It has also been similarly suggested that low levels of antigen-specific IgA antibodies in breast milk were associated with an increased risk for development of sensitization to foods in the child. Furthermore, several cytokines and chemokines involved in the mediation of allergic reactions, transforming growth factor- β , interleukin-10, interleukin-4, or RANTES, have been found in breast milk.

The composition of the cytokines might differ between allergic and nonallergic mothers, thus explaining a possible role of the cytokines in protecting or favouring

the development of atopy in the infant. Other dietary factors, such as fatty acids, might play a role in atopy prevention. The presence or absence of a specific substance is not the only factor.

Current recommendations and current literature

Breast-feeding is widely encouraged for the first 4–6 months. The joint statement of the European Society for Paediatric Allergology and Clinical Immunology (ESPACI) and the European Society for Paediatric Gastroenterology, Hepatology and Nutrition (ESPGHAN) is that 'exclusive breast-feeding during the first four to six months of life might greatly reduced the incidence of allergic manifestations and is strongly recommended' (4). Such statements are based on the numerous studies published to date. Most, however, cannot undergo a comparative analysis because of wide methodological differences.

Studies on the prevention of atopy were mostly focused on monitoring more than one manifestation of atopy, i.e. atopic eczema dermatitis syndrome (AEDS) as well as respiratory manifestations, and the pattern of sensitization to common allergens. The main drawbacks of the studies are ethical issues. Indeed it is not possible to randomize groups of patients to breast-feeding, or formula-feeding. Thus, in most studies infants were at least partially breast-fed before any randomization could be made.

Several studies were in favour of breast-feeding for protection against allergy. A prototypic study was

recently published by a Swedish group who followed prospectively a birth cohort of 4089 infants (5). The large number of participants allowed accurate statistical analysis, confounding factors such as partial breast-feeding were analysed and taken into account, and information about allergic symptoms was obtained by standardized parental questionnaires. Children breast-fed exclusively for the first 4 months or more of life exhibited less asthma (OR 0.7, 95% CI 0.5–0.8), and less AEDS (OR 0.8, 95% CI = 0.7–1.0). Exclusive breast-feeding also prevented children from having multiple allergies during the first 2 years of life. Furthermore, the results from the studies also suggested that partial breast-feeding had a protective effect on allergic diseases. One might argue that the short follow-up does not provide an accurate view of the 'real' atopic potential of the study population, but further follow-up reports are expected.

An Australian study by Oddy et al. followed children who were breast-fed or not breast-fed up to 6 years of age (6). At this age, atopic patients are mostly suffering from respiratory manifestations, which were investigated in particular in this study. The authors found in breast-fed children a significant reduction in the risk of developing asthma at age 6 if breast-feeding was continued exclusively for at least 4 months. In this study, skin testing was also performed, but no data were available on AEDS. Indeed, most long-term analyses focus on current manifestations of atopic diseases, i.e. respiratory allergy in older children. A Cochrane database meta-analysis was performed on cow's milk avoidance and the development of childhood wheeze in children with a family history of atopy (7). This review only considered studies with hydrolysed vs nonhydrolysed formulas; it might provide interesting data for interpretation of other studies. Only six trials were considered in this meta-analysis, which concluded that hydrolysed formula was protective for allergic diseases. Another meta-analysis investigated the role of breast-feeding and the risk of developing bronchial asthma in childhood (8). Twelve prospective studies were analysed by the authors, who concluded that the odds ratio for the protective effect of breast-feeding was 0.7. The effect was even greater in children with a family history of atopy (OR 0.52). Again, the study mostly considered bronchial asthma in childhood. The same authors performed a meta-analysis of prospective studies on protection from allergic rhinitis during childhood (9). They concluded, that exclusive breast-feeding during the first 3 months of life protects children from allergic rhinitis whether they are from families with or without a history of allergy.

Finally, the meta-analysis on prevention of AEDS by Gdalevich et al. included 18 prospective studies published between 1966 and 2000, and concluded, that exclusive breast-feeding for at least 3 months after birth was highly protective for AEDS [OR 0.68, 95% CI 0.52–0.88 (2)]. Similarly, the paper published by Odijk et al. analysed 56 studies on an 'expert review' basis, and concluded that

there was a preventive effect of breast-feeding on the later development of atopic diseases (1).

Studies that show no effect of breast-feeding on AEDS or on other atopic diseases have recently been published, and are most intriguing to the international community of paediatricians, the majority of whom are strong believers in the protective effect of breast-feeding on atopy. The study by Sears et al. prospectively followed a birth cohort from New Zealand for 30 years (10). Again, mostly respiratory symptoms were investigated. These authors found that breast-feeding was not protecting the children against the development of asthma. Furthermore, they concluded, that breast-feeding might even be a factor increasing the risk of atopy. This study especially highlights the differences in the pattern of breast-feeding between countries, or at different times. Indeed, most of this study population from New Zealand was only partially breast-fed and supplements of common milk protein-based formula were given to many children. It remains questionable how these factors, however, included in the statistical evaluation of the results, might have contributed to the negative results of the study.

Duration of breast-feeding and AEDS

Finally, two interesting studies investigated the effect of the duration of breast-feeding on the prevention of atopic eczema. The first was by the German group from the German Multicentre Allergy (MAS) study (11). They showed, that the presence of atopic eczema in the first 7 years of life increased with each additional month of breast-feeding, but also with a history of parental atopic eczema. It seems from the study that multiple factors play a role, but that breast-feeding, at least in some subgroups of the population, might not always be beneficial. Another German study investigated the association between the duration of breast-feeding and the development of atopic diseases (12). These authors found a significant association between the duration of breast-feeding, sensitization to egg, and atopy. Children who had been exclusively breast-fed for at least 5 months were more frequently sensitized to egg, and AEDS was more frequently diagnosed. However, the duration of breast-feeding showed no correlation with the sensitization to egg or the development of atopy in 2-year-old-children.

Should we encourage breast-feeding or not?

Analysis of the above cited studies raises some comments. First, the majority of studies were looking at respiratory disease, and only in some studies was AEDS also considered. However, these allergic diseases are mostly age-dependent. Indeed, skin manifestations early in life disappear in most infants while respiratory manifestations

appearing later in childhood tend to have a longer duration. Thus, could breast-feeding protect (only, or more efficiently) from one atopic manifestation, but not from another? The question remains open. Furthermore, the studies comprise many variables that are hard to integrate. For ethical reasons, it is not possible to randomize the populations correctly and in most groups breast milk was administered for a specific period of time which varied from study to study. The study by Sears et al. also shows that specific habits may also make interpretation of studies more difficult (10).

Furthermore, it is a common observation that in some children with strong manifestations of eczema, stopping breast-feeding might dramatically improve the condition of the skin. Most of these children are already sensitized to common foods, and one might interpret the improvement of the skin condition by diminished exposure to common food allergens. Although breast-feeding does not only prevent from atopic diseases, as shown in most studies, but also has numerous other advantages, one must consider that in a few infants, mostly a subgroup

of patients with a strong history of family atopy, prevention of atopy might not always benefit from breast-feeding.

Infants should be evaluated early in life, when the first manifestations of severe AEDS appear, and one might then consider suggesting that breast-feeding be stopped and consider introducing an extensively hydrolysed formula. This measure might prevent the child from developing multiple food sensitivities and might dramatically improve early manifestations of atopy. How this would affect later allergic manifestations such as respiratory diseases remains unknown.

In conclusion, breast-feeding is beneficial for most infants and should be encouraged. In children with an atopic risk, breast-feeding should also be encouraged. However, there is a subgroup of patients, not well-defined as yet, who might not benefit from breast-feeding, indeed this measure might be harmful. A major task for future investigators is to define this population of patients better so as to be able to provide appropriate advice on dietary measures early in life.

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