Prevention of Atopic Eczema by Nutritional Intervention during Infancy

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Key Messages
Atopic eczema affects 1 of 3 children with a family history of eczema, with about half of them developing the skin lesions during infancy.

The risk for eczema can be significantly reduced by feeding a hydrolyzed infant formula during the first 4 months of life if breast-feeding is not sufficient.

Atopic eczema is the most common allergic manifestation in the first decade of life with an increasing incidence worldwide. Particularly moderate to severe forms have a major impact on the quality of life of the children and their families (Fig. 1). In more than 50% of affected children, atopic eczema develops in infancy. The risk is twice as high in children with a family history of allergy compared to those without any known genetic factors. This holds true for infants who have been exclusively breast-fed for the first 4 months of life and those who received formula. Since it has been recognized that early contact with food allergens plays a role in the development of both tolerance of and sensitization to food antigens, nutritional intervention strategies have been suggested for primary allergy prevention.

Most of these nutritional intervention trials of allergy prevention have been performed in infants with an increased familial risk for allergies.

By far the largest trial, the German Infant Nutritional Intervention (GINI) study, included 5,991 children. A non-interventional arm (n = 3,739) followed children with or without familial predisposition. Children from allergic families whose parents agreed to participate in the double-blind intervention study were randomly assigned to one of four formulas at birth. Breast-feeding was encouraged in all, but in case of insufficient breast-feeding, the infants received one of the study formulas, which were packed in identical tins for blinding. There were two ‘normal’ tasting formulas, a standard cow’s milk formula (CMF) and a partially hydrolyzed whey (pHF-W) as well as two bitter tasting extensively hydrolyzed formulas based on either whey (eHF-W) or casein (eHF-C) [1–3]. The children were assessed on a regular basis by questionnaires, physical examinations and blood testing. After 10 years of follow-up, the protective effect of the hydrolyzed formulas on atopic eczema was still evident [4]. Compared with CMF, the hydrolyzed formulas reduced atopic dermatitis, both in the per-protocol analysis and the intention-to-treat analysis including all randomized children except for those who were exclusively breast-fed during the first 6 months of life. These effects were significant for the pHF-W and the eHF-C, while for the eHF-W the results showed borderline effects (Fig. 2). The preventive effect of early nutritional intervention developed during infancy and persisted until 10 years of age. During the 10-year follow-up, no significant effect was observed on asthma or allergic rhinitis.

In conclusion, the 10-year follow-up data of the GINI study support the use of hydrolyzed formulas in high-risk infants during the first 4 months of life if exclusive breast-feeding is not possible in order to reduce the burden of eczema in these children.

References

Fig. 1. Severe itching: atopic dermatitis in a 9-month-old infant.

Fig. 2. Cumulative incidence of atopic eczema at 10 years of age in the four study groups. The intention-to-treat analysis included all children except for those who were exclusively breast-fed for the first 6 months of life. The per-protocol analysis included 988 children who followed the protocol and received one of the study formulas with or without breast-feeding. The asterisks indicate significant risk reduction compared to CMF.