Complementary Foods and the Development of Food Allergy

Background
The prevalence of allergic diseases in children is increasing in Western Europe and other developed countries.1,2 Allergic reactions to food components are of particular concern in infants and young children.3 In prospective studies the incidence of cows' milk protein allergy in infancy has been estimated at about 2% to 3%.4,5 Allergic reactions are also frequently observed against egg, white, fish, cereals, nuts, peanuts, and soybean and thus against complementary food products. In infants with documented allergy against complementary foods, the basic treatment is complete avoidance of the causal protein.3

In view of the high and rising prevalence of food allergies, strategies for prevention are appealing. Exclusive breastfeeding with exclusion of cows' milk formulas and complementary foods during the first 4 to 6 months is presumed to have a preventive effect against the occurrence of allergic symptoms, extending beyond the period of breastfeeding. However, the size of the effect remains controversial.6-8 Scientifically rigorous evidence is not available because infants cannot ethically be randomly assigned to breast or formula feeding to exclude securely the effect of confounding factors, which may highly influence the results of published studies. However, one study from Finland suggested a long-term protective effect of breastfeeding. In a prospective study on unselected newborns followed up until the age of 17 years, exclusive breastfeeding was associated with lower rates of eczema and food allergy at 1 and 3 years of age, and a lower score of respiratory allergy up to 17 years, when compared with the early feeding of cows' milk formula.9 Some prospective studies have shown that the introduction of soy products into the diet of infants is as allergenic as the introduction of cows' milk protein, and therefore the use of formulas based on soy protein are not recommended for the prevention of food allergy.3,4,7 but opposing views exist9,10,11 and further studies are needed to clarify the allergenicity of soy protein in infancy.

The introduction of complementary foods (bikost) during the first 4 months of life has been associated with a higher risk of atopic dermatitis up to the age of 10 years.12 A further delay of the introduction of foods that are empirically known to frequently cause food allergy has often been advocated. For example, some have advised not introducing dairy products, eggs, wheat, nuts, and fish before the end of the first year of life, and then introducing only a limited number of foods with a low allergenicity. However, there are no well-designed studies to demonstrate the benefit of such advice. The prospective studies that have reported benefits of the late introduction of complementary foods in infants with high risk for allergy, as determined by their family history, have used combinations of several preventive measures.13,15 Thus, the contribution of particular regimens for the introduction of complementary foods cannot be specifically determined.

In addition to food proteins, fatty acids in infant diets also might modulate the probability of allergic disease manifestations.16 In a series of studies, the amount and composition of dietary polyunsaturated fatty acids,17,18 the ratio between n-6 and n-3 polyunsaturated fatty acids,19,20 and the intake of trans fatty acids21 has been correlated with manifestations of allergic disease. Whether or not the lipid composition of complementary foods has a role to play in the development of atopic disease remains to be determined.

Research Issues
Questions for further research with respect to complementary foods and allergy include:

1. To which extent do choices on the introduction of complementary feeding influence the later prevalence of allergic diseases?
2. Which particular risk groups may be affected by variation of complementary feeding regimens?
3. To what extent does introduction of complementary foods after the age of 4 months influence the risk of developing allergic disease?
4. Does the amount and type of lipids provided with complementary foods modulate later allergy risk?

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