Food allergy prevention: should we recommend early exposure or avoidance of allergen-rich food?

Alessandro Fiocchi

It is controversial whether the best way to prevent food allergies is total allergen avoidance or controlled exposure. Following early studies which found that infants younger than 6 months who consumed various foods had increased rates of eczema and food allergies than those exposed later,[1-3] pre-2007 guidelines recommended absolute avoidance or delayed introduction of allergenic foods to prevent sensitization and subsequent disease in predisposed children.[4] However, more recent studies have swung current thinking toward a less polarized view.[5] Birth cohort studies have found no evidence that delaying the introduction of solids reduces food sensitization or allergies. For example, delayed introduction of solids for 4–6 months did not prevent asthma or eczema,[6] or atopic dermatitis or sensitization at age 2 years in either healthy or at-risk children.[7]

Consequently, the most recent international guidelines do not recommend avoidance or delayed introduction of allergenic foods, including fish, egg and peanut, in either healthy or at-risk children and irrespective of whether infants are fed human milk or cow milk formula.[8]The prevailing consensus is to breastfeed for as long as possible and feed a child at around 4-6 months, when they are hungry and developmentally ready.

Intriguingly, observational studies suggest that early introduction of solid foods may actually prevent allergies. Consuming fish during the first year of life was found to reduce children's risk of allergic diseases and sensitization,[9] and earlier (<8–9 months) versus later (>18 months) fish introduction has been associated with reduced risk of eczema[10,11] and allergic rhinitis.[12,13] Similarly early introduction of oats appears to prevent asthma[12,13] and early solid food (<4 months) to prevent peanut and egg sensitization.[14] Promoting tolerance by exposure to allergenic foods is a tantalizing concept, but it may be over simplistic and would be premature to advocate as a prophylactic measure, because reported associations may result from reverse causality, which blights all observational studies. Only randomized controlled trials (RCTs) can determine definitively whether early allergen exposure increases or decreases tolerance, or is neutral.[1] Several RCTs are underway to investigate the relationship of sensitization and food allergy to introduction of allergenic foods such as egg, cow milk, fish and peanut. Until the results are known, and given that exposure is prerequisite for sensitization and subsequent allergy, it is prudent to take a balanced standpoint and also to consider other potential causes, particularly the hygiene hypothesis and other modern lifestyle factors.[15]

> ***"International guidelines do not recommend avoidance or delayed introduction of allergenic foods"***
>
> *Alessandro Fiocchi*

Although many guidelines advocate avoidance to treat children with known food allergies,[16-18] total elimination should be implemented cautiously, since it may unnecessarily restrict children's' diet.[19] Prolonged elimination may even increase the risk of severe reactions in previously non-allergic children.[20] Some children with cow milk protein allergy (CMPA) can tolerate cow milk if it is taken in small doses[21]or cooked,[22,23] in which case, changing from a milk-free to a milk-limited diet might substantially improve their quality of life;[23] however, it has been uncertain whether this practice has immunological consequences or hastens recovery.[23,24] A recent study found that children with CMPA who are switched to a diet containing hydrolyzed CMP eventually recover, but have longer duration of allergy compared to those not exposed to CMP.[25] While partial avoidance may be possible and beneficially modulate food allergy in some cases, it could also precipitate severe

From Department of Child and Maternal Medicine, University of Milan Medical School, Melloni Hospital, Milan, Italy

reactions, whereas strict avoidance undoubtedly helps to prevent severe reactions in allergic children, does not worsen food allergy, and helps some to become tolerant.

References

1. Saarinen UM. Prophylaxis for atopic disease: role of infant feeding. Clin Rev Allergy. 1984;2:151-67.
2. Kajosaari M, Saarinen UM. Prophylaxis of atopic disease by six months' total solid foods elimination. Acta Paed Scand. 1983;72:411-5.
3. Fergusson DM, Horwood LJ, Shannon FT. Early solid food feeding and recurrent childhood eczema: a 10-year longitudinal study. Paediatrics. 1990;86:541-6.
4. Fiocchi A, Assa'ad A, Bahna S; Adverse Reactions to Foods Committee; American College of Allergy, Asthma and Immunology. Food allergy and the introduction of solid foods to infants: a consensus document. Ann Allergy Asthma Immunol. 2006;97:10-21.
5. Palmer DJ, Prescott SL. Does early feeding promote development of oral tolerance? Curr Allergy Asthma Rep. 2012;12:321-31
6. Zutavern A, von Mutius E, Harris J, Mills P, Moffatt S, White C, et al. The introduction of solids in relation to asthma and eczema. Arch Dis Child. 2004: 89:303-8.
7. Zutavern A, Brockow I, Schaaf B, Bolte G, von Berg A, Diez U, et al; LISA Study Group. Timing of solid food introduction in relation to atopic dermatitis and atopic sensitization: results from a prospective birth cohort study. Pediatrics. 2006: 117: 401-11.
8. Greer F, Sicherer S, Burks A; AAP Committee on Nutrition – AAP section on Allergy and Immunology. Effects of early nutritional interventions on the development of atopic disease in infants and children: the role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. Pediatrics. 2008;121:183-91.
9. Kull I, Bergström A, Lilja G, Pershagen G, Wickman M. Fish consumption during the first year of life and development of allergic diseases during childhood. Allergy. 2006:61:1009-15.
10. Alm B, Aberg N, Erdes L, Möllborg P, Pettersson R, Norvenius S, et al. Early introduction of fish decreases the risk of eczema in infants. Arch Dis Child. 2009;94:11-5.
11. Hesselmar B, Saalman R, Rudin A, Adlerberth I, Wold A. Early fish introduction is associated with less eczema, but not sensitization, in infants. Acta Paediatr. 2010;99:1861-7.
12. Nwaru BI, Erkkola M, Ahonen S, Kaila M, Haapala AM, Kronberg-Kippilä C, et al. Age at the introduction of solid foods during the first year and allergic sensitization at age 5 years. Pediatrics. 2010;125:50-9.
13. Virtanen SM, Kaila M, Pekkanen J, Kenward MG, Uusitalo U, Pietinen P, et al. Early introduction of oats associated with decreased risk of persistent asthma and early introduction of fish with decreased risk of allergic rhinitis. Br J Nutr. 2010;103:266-73.
14. Joseph C, Ownby D, Havstad S, Woodcroft K, Wegienka G, MacKechnie H, et al. Early complementary feeding and risk of food sensitization in a birth cohort. J Allergy Clin Immunol. 2011;127:1203-10.
15. Prescott S, Bouygue GR, Videky D, Fiocchi A. Avoidance or exposure to foods in prevention and treatment of food allergy? Curr Opin Allergy Clin Immunol. 2010,10:258-66.
16. American College of Allergy, Asthma, & Immunology. Food allergy: a practice parameter. Ann Allergy Asthma Immunol 2006;96(3 Suppl 2):S1-68.
17. United Kingdom national Institute for Health and Clincial Excellence (NICE). NICE clinical guideline 116. Food allergy in children and young people: Diagnosis and assessment of food allergy in children and young people in primary care and community settings [Internet]. NICE; 2012. [cited 2012 Oct 22]. Available from: http://www.nice.org.uk/nicemedia/live/13348/57929/57929.pdf
18. NIAID-Sponsored Expert Panel, Boyce JA, Assa'ad A, Burks AW, Jones SM, Sampson HA, et al. Guidelines for the diagnosis and management of food allergy in the United States: report of the NIAID-sponsored expert panel. J Allergy Clin Immunol. 2010;126(6 Suppl):S1-58.
19. Sinagra JL, Bordignon V, Ferraro C, Cristaudo A, Di Rocco M, Amorosi B, Capitanio B. Unnecessary milk elimination diets in children with atopic dermatitis. Pediatr Dermatol. 2007;24:1-6.
20. Flinterman AE, Knulst AC, Meijer Y, Bruijnzeel-Koomen CA, Pasmans SG. Acute allergic reactions in children with AEDS after prolonged cow's milk elimination diets. Allergy. 2006;61:370-4.
21. Fiocchi A, Terracciano L, Bouygue GR, Veglia F, Sarratud T, Martelli A, et al. Incremental prognostic factors associated with cow's milk allergy outcomes in infant and child referrals: the Milan Cow's Milk Allergy Cohort study. Ann Allergy Asthma Immunol. 2008;101:166-73.
21. Lemon-Mulé H, Sampson HA, Sicherer SH, Shreffler WG, Noone S, Nowak-Wegrzyn. Immunologic changes in children with egg allergy ingesting extensively heated egg. J Allergy Clin Immunol. 2008;122:977-83.
22. Nowak-Wegrzyn A, Bloom KA, Sicherer SH, Shreffler WG, Noone S, Wanich N, et al. Tolerance to extensively heated milk in children with cow's milk allergy. J Allergy Clin Immunol 2008, 122:342-47.
23. Skripak JM, Wood RA. Mammalian milk allergy: avoidance strategies and oral desensitization. Curr Opin Allergy Clin Immunol. 2009;9:259-64.
24. Kim JS, Sicherer S. Should avoidance of foods be strict in prevention and treatment of food allergy? Curr Opin Allergy Clin Immunol. 2010;10:252-7.
25. Terracciano L, Bouygue GR, Sarratud T, Veglia F, Martelli A, Fiocchi A. Impact of dietary regimen on the duration of cow's milk allergy. Cin Experim Allergy. 2010, 40:125-9.