KAAACI Symposium 3: Cutting-edge clinical practice

Prevention of food allergy: where are we now and where are we going?

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Food allergy is common among children with 5-7% prevalence in Korean children and 2%-10% prevalence worldwide. The development of food allergy is likely to reflect an interaction between genetic factors and environmental exposure. Primary prevention is the blocking immunologic sensitization to foods. Secondary prevention is the suppression of disease expression after sensitization. Tertiary prevention is avoiding symptoms after disease expression.

For primary prevention of food allergy, early exposure to food allergens through maternal and infant diet have been investigated. Several studies published over the last decade have suggested that the introduction of potentially allergenic solid foods before age 6 months may be associated with a decreased risk of developing food allergy. Learning Early about Peanut Allergy (LEAP) study showed that the early introduction of peanuts significantly decreased the frequency of the development of peanut allergy among children at high risk for this allergy and modulated immune responses to peanuts. Early introduction of peanut was also found to be effective at preventing peanut allergy in a per-protocol but not ITT (Intention to treat) analysis of children who participated in the EAT (Enquiring about Tolerance Study) study. According to meta-analysis of based on these two studies, 'moderate certainty' of evidence that introducing peanut between 4 and 11 months of age reduced the risk of peanut allergy was founded.

For the prevention of egg allergy, several trials from different countries have published. In the Beating Egg Allergy Trial (BEAT) Study from Australia, introduction of whole-egg powder into the diets of high-risk infants reduced sensitization to EW and induced egg-specific IgG4 levels. But, 8.5% of infants randomized to egg were not amenable to this primary prevention. The 2-step egg introduction in high-risk infants with eczema (PETIT) study demonstrate a statistically significant decrease in allergy to egg in the ITT analyses. No significant effect on egg white-specific IgE levels was noted in the Hens' Egg Allergy Prevention (HEAP) study in general population of Germany. STEP (Starting Time for Egg Protein) and

STAR (Solids Timing for Allergy Research) studies from Australia also showed no significant difference of egg allergy. The EAT study found a significant difference in egg allergy for the per-protocol population, but no efficacy in an ITT analysis. In spite of diverse results of individual studies, a meta-analysis introduced that 'moderate certainty' of evidence that introducing egg between 4 and 6months of age reduced the risk of egg allergy was noted. The EAT study also demonstrates that other multiple allergenic foods can be introduced into the infant diet. The introduction of allergenic foods was safe, and there was no adverse influence on breastfeeding. For longer term effects were evaluated in LEAP-On study; persistence of oral tolerance to peanut. Absence of reactivity was maintained in participants who had consumed peanut in the primary trial even after a 12-month period of peanut avoidance.

Eczema and sensitization via skin seems to be another main issue for prevention of food allergy. In a hospital-based birth cohort study, infants with early eczema onset (especially within the first 1-4 months after birth) were found to have an increased risk of developing food allergy at 3 years of age. Environmental exposure to peanut during infancy (assessed by household peanut consumption) increased the risk of peanut allergy; however, if infants consumed peanut in the first year of life, they were protected against peanut allergy. The dual-allergen exposure hypothesis suggests that allergic sensitization to food occurs through low-dose cutaneous sensitization, whereas early consumption of food protein induces oral tolerance. Recent trials have shown that avoiding peanuts during infancy increases the risk of peanut allergy; however, these studies did not address maternal peanut consumption. In the secondary analysis of a nested cohort within the 1995 Canadian study, maternal peanut consumption while breast-feeding paired with direct introduction of peanuts in the first year of life was associated with the lowest risk of peanut sensitization, compared with all other combinations of maternal and infant peanut consumption. They suggest both passive peanut exposure through breast milk and peanut introduction in the first year of life may decrease the risk of peanut sensitization at age 7.

Recently, guidelines for primary prevention of food allergy from Europe and United states were updated and consensus communication on early peanut introduction has been demonstrated. For the first 4-6 months after birth, exclusive breastfeeding is recommended and if impossible, extensively or partially hydrolyzed infant formula can be recommended in high risk infant. Introducing complementary foods is recommended between 4 and 6 months of age, even in case of potentially allergenic foods such as egg, milk and wheat. For the prevention of peanut allergy, early introduction of peanut could be better than delay in selected high risk infants based on test results. For infant with mild-to-moderate eczema, introduction of peanut-containing foods around 6 months is recommended. For infant with no eczema or any food allergy, introduction of peanut-containing foods in accordance with family preferences and cultural practices is recommended. Peanut allergy is much less prevalent in Asia compared to the West. Varying patterns of food allergy are seen even within Asian countries. In infants in the Growing Up in Singapore Towards healthy Outcomes (GUSTO) study, food allergy rates in Singapore are low despite delayed introduction of

allergenic foods. In the concern of GUSTO study, early introduction of allergenic foods may thus not be necessary in populations in which overall food allergy prevalence is low, and thus infant feeding recommendations should be carefully tailored to individual populations. APAPARI proposes the following recommendations on the introduction of allergenic foods in infants for the prevention of food allergy in Asia. No changes in feeding guidelines are recommended for healthy infants; to introduce complementary foods at 6 months of age. For infants at risk, there should be no delay in the introduction of allergenic foods (including egg, cow's milk, peanut, soy, wheat, and shellfish). For infants with severe eczema, allergy testing (skin prick tests and/or sIgE) and oral food challenge are recommended. Introduction of the allergenic food into the infant's regular diet is up to results.

Early consumption of peanut in infants at high risk of peanut allergy is allergen specific and does not prevent the development of other allergic disease, sensitization to other food allergens and aeroallergens, or reported allergic reactions to tree nuts and sesame. Furthermore, peanut consumption does not hasten the resolution of eczema or egg allergy. Further studies that explore the efficacy of oral tolerance induction to food allergens and that focus on optimal timing, duration, adherence and longer effects are required. Proper feeding guidelines for individual country should be suggested with concern of prevention for food allergy.

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