An Ounce of Prevention in the Food Allergy Crusade

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EDITORIAL

The National Institute of Allergy and Infectious Disease (NIAID) defines food allergy as “an adverse health effect arising from a specific immune response that occurs reproducibly on exposure to a given food.” It is not a condition with an available treatment option other than avoidance and supportive therapies [1]. Children usually fall victim at a very young age to food allergies, including milk, eggs, tree nuts and peanuts, and some of these allergens will continue to manifest into adulthood. Food allergy affects a significant part of the population, with many studies showing that prevalence has been increasing over the past several years. Currently it affects about 5% of adults and 8% of children [2]. The US National Health Interview Survey in 2013 showed that children age 0-17 years had an increased prevalence of food allergies from 3.4% in 1997-1999 to 5.1% in 2009-2011 [3]. With this current growth, there have been many recommendations about prevention which have changed in ideology in the recent years. It has been proposed in the past that avoidance was the best preventative option. Recent statements have, however, argued against this and have instead proposed to look at introduction at an earlier time frame for prevention of allergic diseases.

There have been several studies done looking at the correct timing for introduction of highly allergenic foods such as eggs and peanuts. The systematic review done by lerodikakonou and colleagues evaluated the risk of allergy of early introduction of egg or peanut into the infant’s diet [4]. Results showed that there was ”moderate-certainty evidence” for decreased peanut allergy with introduction at age 4-11 months and for egg allergy with introduction at age 4-6 months. The limitations to this study however were that data was either inadequate or trial sequential analysis was indeterminate, and thus the authors concluded that further trials would be needed to confirm this [4].

A few studies have looked specifically at introducing eggs into an infant’s diet and evaluating any benefit in allergy reduction. The Beating Egg Allergy Trial (BEAT) is a randomized control study that looked at infants 4 months of age with a first-degree relative who had a history of atopic disease and only included those infants who had a skin prick test (SPT) of <2mm [5]. These infants were then given either daily 250 mg of egg protein or rice powder placebo daily. The study primarily looked at those that were sensitized to egg at the age of 12 months in each group based on a positive SPT of greater than or equal to 3 mm. It was shown that the treatment group had fewer rates of egg sensitization compared to placebo group; however, this is distorted by the fact that there were several infants excluded from the allocated treatment group as they reacted to egg at introduction [5]. Another randomized control study known as the Two-step Egg Introduction for Prevention of Egg Allergy in High-risk Infants With Eczema (PETIT) trial looked at infants with a history of eczema but excluded those with a history of egg ingestion or known allergic reaction to egg [6]. These infants were given 50 mg of heated egg powder daily from ages 6 to 9 months and then 250 mg daily until age 12 months in the treatment group. Oral food challenges were done at 12 months of age and it was found that five of 60 (8%) in the treatment group and 23 of 61 (38%) in the placebo group had egg allergy. This also should be interpreted with caution as this study was terminated early due to the significant difference leading to a possible overestimation of the effect. However, this study did bring to light that initiating a two-step approach with controlling underlying eczema might be a safe alternative to exposing high-risk infants to allergenic foods [6].

When looking at peanuts, the Learning Early about Peanut Allergy (LEAP) study was the first to show positive results [7]. Infants 4-11 months old with a history of severe eczema, egg allergy or both were randomized to a treatment group or placebo group. These infants also underwent skin prick testing to peanut prior to randomization and were separated into a group with a wheal size of 1 to 4 mm (sensitized group) and those with no wheal (nonsensitized group). Among the 542 of the total 640 infants in the nonsensitized group, data from 530 was used for analysis which showed that 13.7% had developed peanut allergy in the avoidance group and 1.9% had developed the allergy in the consumption group (p<0.001). Among the 98 infants in the sensitized group, 35.3% in the avoidance group and 10.6% in the consumption group were determined to have a peanut allergy (p=0.004). This study showed that early introduction of peanut did in fact decrease the number of those who developed the allergy later on at age 60 months and was associated with an 86% and 70% relative risk reduction in the nonsensitized and peanut sensitized groups, respectively [7]. The LEAP-On study provided additional data looking at the same infants with...
a 12-month period of peanut avoidance to determine if this absence of exposure would lead to allergy development. It was determined that children who underwent the avoidance period and who were originally part of the peanut tolerant group would continue to maintain this tolerance [8].

Because the prevalence of food allergies is rising, it is important to continue to study the benefit of early introduction. Foods such as milk, egg, tree nuts, and peanuts tend to be the most common allergens. While we have had some evidence showing benefit of early introduction of peanut with the LEAP study, there is limited research on the others [7]. While children can grow out of milk and egg allergy, tree nut and peanut allergies have a tendency to persist and can become lifelong conditions. The NIAID was recently designated $42.7 million for food allergy research, highlighting the importance of this phenomenon. If a simple feat of changing the introduction time of these foods can be the prevention, this would be as important as discovering a “cure.”

REFERENCES