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Introduction of Peanuts to the Pediatric Patient

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Abstract

Peanut allergies have been diagnosed exponentially over the last ten-years and are more severe now than ever before. (DuToit et al. 2106) Some of the latest statistics are citing more than double the amount of peanut allergies diagnosed in the last few years. Guidelines set forth in 2010, by the American Academy of Allergy, Asthma, and Immunology stated that peanut, milk, soy, wheat, egg, and other tree nuts were to be avoided until three years of age, unless these patients have other chronic illnesses such as asthma or other atopic conditions. If so, the patient is to abstain from these items until the age of five years. Once the patient reaches this stage of life, foods are to be introduced slowly, in small quantities, one food at a time. (American Academy of Allergy, Asthma & Immunology, 2010) The guidelines have changed in the last two-years after a study known as Learning Early About Peanut Study, LEAP, became published in 2015. It was previously advised to withhold peanut-laden foods until at least three years of age. Recent guidelines suggest children who are exposed to these food sources can allow for desensitization from these allergens at an early age, before their immune systems are completely competent, minimizing potential anaphylactic reactions. (Learning Early About Peanut Study, 2011) The results of this project aim to justify the newest guidelines and research and show that introduction to the peanut protein at age four to six months, allows for immune competency in the pediatric body and quite possibly in-utero. The pathophysiology of the immune response is exponentially different as the body continues to be introduced to cross-reactive allergens as you age.

Introduction

“Please refrain from any sort of peanut or peanut butter snack in Simmon’s Elementary School. We have a child who is very allergic to peanuts in the school system.” How many times have you seen a note such as this sent home with your child on the first day of school? Pediatric allergies are being diagnosed more now than ever before. There is an average of 8% of the pediatric population in today’s society with severe anaphylactic reactions to peanut and foods produced in a factory that contain tree nuts. (Wood, 2017) The guidelines for exposing children to peanut and other tree nuts has changed in the last two years, thanks to a study that was performed in the United Kingdom in 2015. This study is called the Learning Early About Peanut Study, or LEAP as it is commonly termed. It has changed the national guidelines regarding the timeline for introduction and consumption of allergens such as peanuts among the pediatric population. For decades, the guidelines stated that children should not be introduced to high-allergen related foods until the age of three. The reason behind this recommendation stemmed from research that suggested the infant body was unable to properly digest the protein found in peanuts. Peanuts and other tree nuts contain protein that the body’s immune system deems foreign when the body has not been properly introduced at an early age. (LEAP, 2011)

Statement of the Problem

For many years, parents have been advised to withhold peanuts from children until the age of three to prevent a peanut allergy in a small child. In 2015, a clinical trial called the LEAP study was completed that has shifted the way some providers practice medicine. This study concluded that it is not beneficial to withhold peanuts and other tree nuts from children, and in fact, is thought to be harming the child by not allowing them to be exposed to this at the age of six months. (LEAP, 2011) This research also stated that in the clinical atopy patient, all of these potential allergens should be held until the age of five. New research now suggests beginning these patients at the age of 4 months or upon first consumption of food sources. (AAAAI, 2017) Some research states that in-utero the fetus potentially receives some immunity from the mother. Other research is controversial to the statement above, denying any link between the mother and child through the placental barrier prior to cutting the cord.

Research Questions

- Does the introduction of peanuts to a child at the age of six months decrease the likelihood of IgE-mediated response from the body?
- What effect does atopy play in the increased likelihood of food allergies for children diagnosed with these conditions?
- What are the possible treatment options for desensitization to peanuts?
- What guidelines should be followed? And Why?

Literature Review

- Clinical trials are being performed on the introduction of peanuts to patients in the peri-pregnancy state. These trials are showing promising results to those patients with a predisposed sensitivity to food allergens due to atopy. Other studies, such as the LEAP study have shown that children who are exposed at young ages to food allergens, such as eggs, milk, wheat, soy, and peanuts, are allowed to build up a tolerance to these highly allergenic foods if exposed repeatedly at a young age, before antibodies have been produced. (LEAP, 2011)
- Children with atopy, marked by eczema (atopic dermatitis), allergies, and asthma are 20% more likely to exhibit food allergies to items such as peanuts. There is a link between the body’s abnormal IgE response to pollens and the response to peanuts. It is thought that the dry, sensitive skin of an atopic patient is a result of loss of essential fatty acids, such as linoleic and linolenic acid, which help to create the epidermal barrier. When the epidermal barrier is weakened due to water loss and dryness, atopens, such as pollens, grass and dust mites, are able to initiate the Th2 lymphocyte response. (Piliang, 2009)

- Skin Prick Tests, (SPT) are live doses of allergens used to penetrate the surface of the skin. This is the safest method of allergen testing available, and can be performed on any child older than six months. If there is high suspicion of a specific allergen with a negative skin test, an intradermal test can be performed to confirm. Results are available in 10-20 minutes. (Sicherer & Wood, 2012)
- Oral Immunotherapy, (OIT) for peanuts is something that has been studied for over 25 years. It consists of peanut containing drops or capsules that contain a specified dose of peanut protein introduced to the patient every day for a two or three-year period of time. This has been reevaluated in the last 10 years, as results 25 years ago had inadvertent outcomes. (Sicherer & Wood, 2012)
- 2017 addended guidelines brought forth by the AAAAI recommend that the most severe cases of atopy allow close monitoring and introduction between the ages of 4-6 months after additional serum IgE and SPT has been completed. If the child is allergic to eggs or has mild to moderate eczema, early introduction is still recommended. Providers are advised to counsel parents on the importance of early introduction of peanuts. (AAAAI, 2017)

Discussion

- Regular ingestion of peanut containing foods and continued feedings at regular intervals up until the age of 5 has proven to reduce the intolerance of these allergens in the child’s immune system. Those patients who were allowed regular consumption of peanuts were 80% less sensitive to peanuts as those who avoided peanuts throughout the pregnancy and first year of life according to the LEAP-ON study. The study suggests that less than 5% of those research subjects that ingested peanuts were sensitive to them. (LEAP-ON 2015) The group that avoided all peanut-laden foods had triple the amount of allergies to peanuts.
- Atopic children are more Th2 shifted immunologically, allowing for increased sensitivity to allergens with more probable outcome of allergies. (Piliang, 2009)
- Treatment options at this time are being explored. Introduction at a younger age is expected to decrease the prevalence of peanut allergies and Oral Immunotherapy is showing sustained unresponsiveness in clinical trials.
- The National Institute of Allergy and Infectious Diseases and the American Academy of Allergy, Asthma & Immunology both recommended introduction of peanuts and other tree nuts between the ages of four to six months. 2017 addended guidelines brought forth by the AAAAI recommend that the most severe cases of atopy allow close monitoring and introduction between the ages of 4-6 months after additional serum IgE and SPT has been completed. If the child is allergic to eggs or has mild to moderate eczema, early introduction is still recommended. Providers are advised to counsel parents on the importance of early introduction of peanuts. (AAAAI, 2017)

Applicability to Clinical Practice

Based on the research presented, it has been highly encouraged that children without atopic conditions be offered peanut laden foods at the age of six months. If these patients have an egg allergy or mild to moderate eczema, it is reasonable to introduce the peanut laden foods with a discussion of education to parents and caregivers to carefully introduce small quantities of peanut laden food. These patients with suspected allergies and severe eczema are to undergo IgE mediated tests and skin prick tests prior to administration. These patients, if positive to the SPT or IgE tests, suggest a high likelihood of allergy when exposed to a small amount of allergen, most appropriately given in a controlled environment, such as a clinic or hospital. (AAAAI, 2017)

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