The Peanut Epidemic

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Abstract

Over 10% of the population in Western countries suffer from allergies, 8% of that being children and 2% of that being adults. These statistics were found by *The Division of Allergy and Immunology* of the University of Pennsylvania School of Medicine in 2019. At the time of the study it was stated that these numbers were most likely to rise, so the population of persons with allergies is presumably significantly larger today. Another contributing factor to a likely higher percentage of the population suffering from allergies than reflected in the study is that the study does not include people who have not been diagnosed with an allergy. These people have not yet been diagnosed either because they have yet to be exposed to an allergen or because they have not sought out treatment. Despite the numbers only representing *some* of the population who have allergies over the past ten years, (XIII) the number of peanut allergies diagnosed in America has increased by 3.5 fold. This increase is extremely significant and it means there is something contributing to the rise of diagnoses of allergies. There are many factors which this rise can be attributed to, including the rise in access to doctors for the general population as well as increasing levels of cleanliness in our living environment which means that when one is exposed to a threatening substance it causes a more adverse reaction. Though these reasons may have had an effect on the increase in allergy prevalence in general, there must be some other reason for the striking increase in peanut allergies specifically within the American population. This sharp rise in the diagnosis of peanut allergies correlates with the overprotection of American children whose parents do not allow them to eat peanuts until middle or late childhood. The reasons for the overprotection of American children is a result of the obsolete

advice of physicians regarding peanuts compounded with the general attitude of parents sheltering their children in America.

Introduction

A little over twenty years ago, doctors advised new mothers to prevent their children from eating peanuts until they were at least a minimum of three years of age. The reason for this was that physicians believed it would abate the rising numbers of children with allergies in the population. Prior to this advice, there was a steady increase in children being diagnosed with allergies and doctors sought for a way to fix that problem, believing the following recommendation would do so.

In 2000, the American Academy of Pediatrics (I) cautioned parents in exposing their children to potential allergens, specifically peanuts, in the child's diet until the age of 3. These guidelines were developed in order to address the rising number of diagnoses of children with peanut allergies. The basis of these guidelines were built upon the premise that infants and toddlers are generally predisposed to have hypersensitive immune systems which become less sensitive with age as the child is exposed to different substances in the environment. The overactive and over-generalizing immune systems of young children can lead to life-threatening reactions. It has also been stated that reactions in children are more dangerous as children cannot express whether or not they are having a reaction if they have not yet reached speaking age. Even children of speaking age may not be able to properly express the adverse symptoms they are experiencing

which can make a treatable reaction more dangerous as well. Thus, it was stated by the American Academy of Pediatrics that due to the possible deadly effect that exposure to an allergen can have on an infant or toddler, parents should avoid introducing allergic-reaction producing foods into the diet of a child until that child is at least at the age of 3.

The guidelines of the American Academy of Pediatrics and the doctors backing those statements believed they were preventing children from having allergic reactions at a young age. When the prevalence of allergies did not stabilize but actually increased with the introduction of these suggestions, these guidelines were rescinded. In 2017, (II) after various studies, which will be discussed below, had been conducted between countries with a high rate of allergies and countries with a low rate of allergies, it was found that in the countries with low rates of allergies potential allergens were introduced into the diet early on in a child's development. The potential allergens were introduced into the child's diet as early as a few months of age. Due to the findings of such studies, doctors presently tell new mothers to give their children peanuts at an early age, when a baby is a few months old, in order to prevent these allergies from developing.[1] If doctors had not given this advice to parents, it may have reduced the rising numbers of allergies in the population.

Background

There are many other food allergies in addition to the peanut allergy. These food allergies have also become more prevalent over time like the peanut allergy, as stated by *The Division of*

[1] This is the general advice given to mothers whose babies would be suspected of having a genetic predisposition to allergies.

Allergy and Immunology. Some of the more common food allergies are eggs, dairy, shellfish, tree nuts, and sesame seeds. As these allergens are all foods, the most common means of exposure are via consumption of the allergen in the diet. There are allergens other than food, such as seasonal allergies, medications, or animals as well, which the mechanism of exposure to these non-food allergens is via the environment. [2] Though the ways of exposure to an allergen may differ depending on the form of allergen, the common principle of all allergens is that a person is exposed via ingestion of allergen particles into the body from either consuming it or coming in contact with it in the environment. (VIII) The ingested particles are subsequently recognized and targeted by the immune system, thereby triggering the immune response.

The Immune System

The immune system of the body has two major pathways through which it targets, destroys, and eliminates foreign substances from the body. The two pathways are the innate immune system and the adaptive immune system, classified as the general and specialized immune systems respectively. The innate immune system is deemed the "first line of defense" as it comprises the skin, general cells, and the nonspecific proteins of the immune system. The reason it is termed the innate immune system is that the molecules which comprise it are all present in circulating prior to exposure to a pathogen. For example, the cells of the innate immune system are deemed general immune cells as these cells are not specifically created in response to *one* substance but are preprogrammed to target all pathogens. As the cells of the innate immune system are constantly circulating the blood, these cells encounter a forgein substance first. When these cells recognize a substance as foreign to the body, the innate immune response is triggered.

[2] In the case of medication, a person is generally exposed via consumption of the allergen as well.

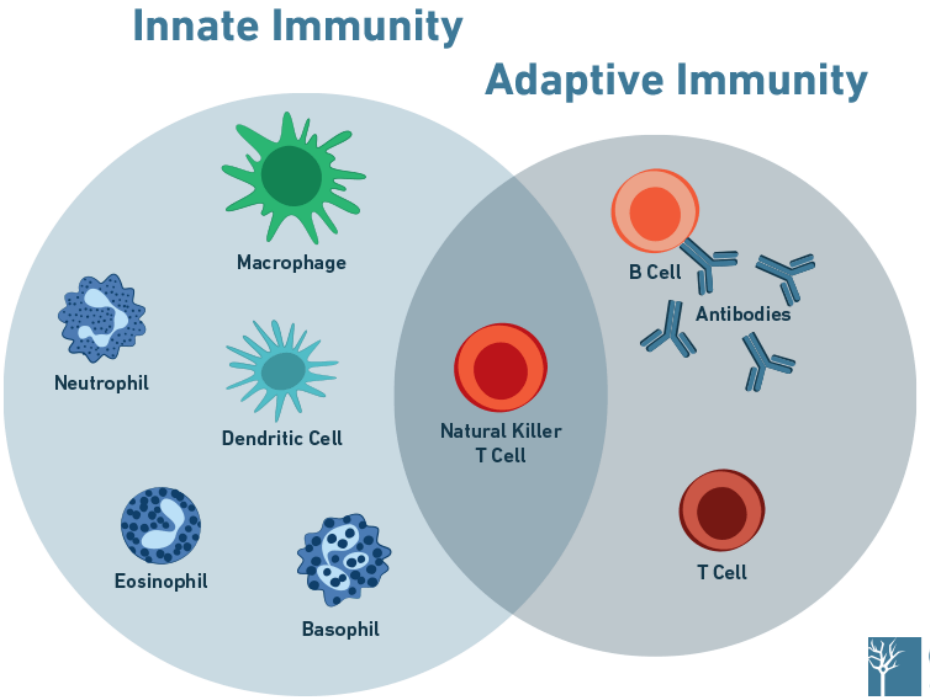

Figure 1. The Cells of the Immune System[XVIII]

The cells of the innate immune system, as illustrated above, are: macrophages, neutrophils, natural killer cells, mast cells, eosinophils, dendritic cells, and basophils. Macrophages and dendritic cells are phagocytic cells which engulf foreign pathogens that enter the body and break them down. Once the pathogen is broken down, these cells become antigen presenting cells in which the dendritic cells and macrophages display the broken down antigen on their surface. This is the mechanism by which the macrophages and dendritic cells alert the body of invasion of a pathogen. Eosinophils and basophils, including mast cells, are termed "granulocytes" since these cells store a variety of particles which can be released into the bloodstream after these cells are triggered by the body. When these cells are stimulated, they release their contents to the

blood and tissues of the body to begin to break down. The third type of innate immune cells are the natural killer cells. Both the presentation of the pathogen and release of chemicals by the granulocytes attracts the natural killer cells to eliminate the foreign pathogen. (V)

This is the initial bodily response when a substance which enters the body is deemed foreign. Though the innate system is the first group of cells which deal with a pathogen, it is not the most effective, since the innate cells are only programmed to produce a general immune response. In the case where the innate immune system is unable to overcome a pathogen, it then triggers the cells of the adaptive immune system.

In order to trigger the response of the adaptive immune system, first the natural killer cells must have been triggered via the innate immune system. The adaptive immune system only mounts its response once the natural killer cells are ineffective in properly eliminating the pathogen. As illustrated above, Figure 1, the natural killer cells are the cells which connect the innate and adaptive immune responses.

The response of the adaptive immune system is mediated by three different molecules which work together to ensure complete elimination of a pathogen. The first two molecules, T cells and B cells, make up the cellular component of the adaptive immune system. The third molecule involved in the adaptive immune response are antibodies, specific blood proteins which are created in response to exposure to a pathogen.

T cells are made in the bone marrow and are moved to the thymus where they mature into their proper form. When a pathogen enters the body, the T cells have three general functions in their role of neutralization of a pathogen. One such function is to trigger other immune cells to conduct their response in elimination of the pathogen, these T cells are known as helper T cells. Cytotoxic T cells are the cells which are triggered by helper T cells to break down the pathogen. Cytotoxic T cells are the adaptive immune system's version of natural killer cells, both types of cell function to break down the pathogen in order for the body to eliminate it. The difference between natural killer cells and cytotoxic T cells is that cytotoxic T cells are programmed to first recognize the helper T cells and then break down the marked pathogens. T helper cells also have the ability to become memory cells, cells which recognize substances which the cells were previously exposed to, in order to produce a faster response if that same pathogen is ingested again. T helper cells are also needed to activate B cells, the second cell type which makes up the adaptive immune system. In contrast to T cells which mature in the thymus, B cells are both produced and mature in the bone marrow. Once the B cells are triggered by the helper T cells, the B cells proliferate and transform into plasma cells. These mature plasma cells produce and release antibodies into the blood in order to bind and target the specific pathogen. After the antibodies are released from the B cell into the blood, the antibodies function to bind the pathogen to either break them down themselves or to trigger other proteins to destroy the pathogen. Not only does the antibody binding to the pathogen trigger its destruction, but it also is a way to prevent the pathogen from further binding to any of the body's healthy cells.

There are various types of antibodies within the adaptive immune system; Immunoglobulins M, D, G, A, and E. These antibodies are proteins which can be found both inside of and on the

surface of other immune cells in the body. Immunoglobulin E, IgE, is the antibody which is specifically designed for use in the allergic response. Though that may seem to imply that IgE antibodies are unique to individuals with allergies, that is not the case since all human beings have IgE antibodies in order to fight off parasites which enter the body. The job of IgEs should simply be to break down parasites that enter the body, but in the case of a person with allergies, these IgEs are specialized to recognize and bind to innocuous substances as well which causes the inflammatory allergic reaction upon binding. (XII) The specific IgE mediated allergic response is what distinguishes the symptoms and reaction associated with food allergies, the peanut allergy being one example. (III)

The IgE mediated response does not typically occur after the first exposure to an allergen, rather the antibodies develop subsequent to the first exposure in order to produce the reaction upon ingestion of the particle a second time. In the first exposure to what is considered by the body to be an allergen, a person's IgEs will recognize and bind to that allergen without triggering the reaction. This first encounter provides the IgE's with a way to build memory cells against that antigen. It is only upon the second encounter with the allergen, where it remembers the pathogen, when the IgE mediated allergic reaction occurs. (XVI)

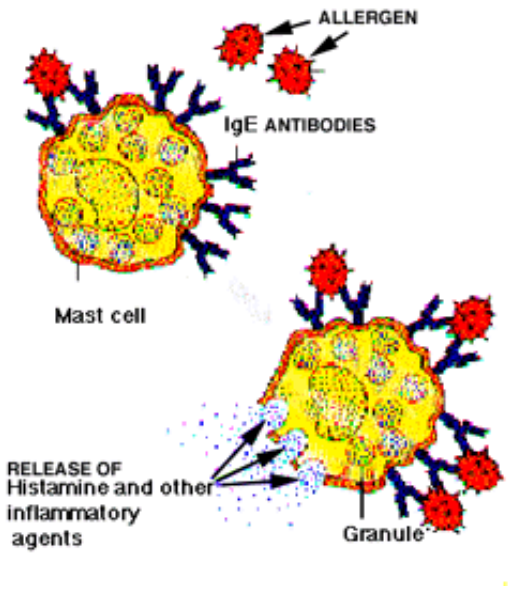

Figure 2. IgE and Mast Cells[XVI]

The process illustrated in the above figure, and that of an IgE-mediated allergic reaction, is as follows. The type of cell which IgE antibodies are on the surface of are mast cells, another form of granulocyte which releases chemical particles. The second time an allergen is recognized and bound by IgEs of a mast cell, the IgEs initiate the breakdown of the allergen. Two IgE antibodies on the surface of the mast cell bind to the antigen which causes the mast cell to undergo degranulation, the breaking down of its cell membrane. The degranulation causes the mast cell to release its chemical contents to attack the pathogen. The chemicals released by the mast cell cause the "allergic reaction" which is associated with symptoms such as sneezing and vomiting. (XVIX)

The three chemicals released by mast cells are histamines, leukotrienes, and cytokines. Histamines and leukotrienes contribute to the severity of the allergic response while cytokines propagate the reaction by driving the proliferation of IgE antibodies. Cytokines are extremely

potent since these chemicals are what cause the reaction to continue. Histamines and leukotrienes similarly cause the reaction to advance as these two chemicals cause the progressive symptoms of the allergic reaction. One such example of a progressive reaction is one which begins with sneezing which can lead to a difficulty in breathing and ultimately constriction of the airways. (XVI)

The way histamines and leukotrienes cause the symptoms of a reaction is as follows. When histamines are released in one area of the body, it first causes a localized itching on the surface of the skin. A person may also develop a rash, redness of the area, or even hives, severe inflammation and welts on the skin. Histamine also causes blood vessels to expand leading to a drop in blood pressure. In a case where the histamine is not broken down by the body, such as by means of treatment with medication, it can cause more dangerous physiological symptoms by traveling to the lungs leading to breathing difficulties and a low drop in blood pressure. Some reactions are so severe that these chemicals can cause anaphylaxis, constriction of the airways, which can be fatal. (XVIX)

Patients tend to undergo what is deemed the fast allergic reaction, so the process described above, with IgEs binding mast cells to allow them to release their chemical contents, happens quickly. The fast reaction is characterized by milder symptoms such as itching and redness of the skin or watery eyes. When left untreated, the fast reaction then transitions into the late response of the body. Because the allergic reaction becomes progressively worse when untreated, each symptom of the fast reaction is manifested in a more severe way in the late response. While sneezing is a symptom of the fast reaction, blockage of the nasal pathway is the symptom analog

of the late response. Similarly, wheezing and coughing are a part of the immediate reaction of the body while difficulty breathing is characteristic of the late response. The fast reaction progresses into the late reaction when the chemicals released by mast cells are not broken down. (XVIX)

Similar Immune Responses

The immune response which occurs after exposure to an allergen is similar to the reaction which occurs after ingestion of toxins or other intolerances of the body. In exploring the reaction of the body to a toxin, the toxin of salmonella bacteria, S-CDT, can be used as an example. Upon infection with S-CDT, the innate immune system is triggered to attack and destroy the bacteria. If the bacteria is not destroyed, it can produce mild symptoms such as sweating and moist hands. The mild symptoms, similar to those of the allergic reaction, also progress to more adverse symptoms such as diarrhea and vomiting. The harsher symptoms associated with salmonella are used by the body in order to eliminate the bacteria from the body. Although the allergic response may produce symptoms similar to vomiting and diarrhea, these symptoms are triggered by histamine and are not a generalized way for the body to eliminate the pathogen from the body. This is because the adaptive immune system is only activated by the allergic response and not in response to a toxin, so although the symptoms are similar, the mechanisms by which they occur and the causes for the symptoms are different. In the case of the allergic response, the adaptive immune system is activated. Salmonella bacteria does not produce an adaptive immune response but rather suppresses the mechanisms of the B and T cells which makes the bacteria extremely dangerous. (II)

Food sensitivities, such as lactose intolerance, also seem to trigger a similar response as both toxins and allergens do, such as nausea and diarrhea. The way in which food sensitivities differ from allergies is also in the mechanism in which they are broken down by the body. Food sensitivities are due to the gastrointestinal tract of the person reacting to the food and not the immune system. Therefore the reaction of the body to a food intolerance is characterized as a digestive reaction rather than an immune reaction, since the immune system is not triggered at all.

Though both toxins and food sensitivities cause similar surface-level symptoms in the body to an allergic reaction, these two categories of bodily reactions are different from allergies because neither of them produce a response of the adaptive immune system. While toxins only trigger the innate immune response, food intolerances do not trigger an immune response at all. (XIII) Although these reactions seem similar on the surface, the body's response to an allergen is unique to allergic reactions.

Treatment

Since the potency of the reaction is mediated by the adaptive immune system, in order to treat and stop a reaction it is most effective to target the immune cells of the adaptive immune system. In order to counteract the effects of the chemicals secreted by mast cells, medications such as antihistamines are administered. Antihistamines block histamine receptors on cells thereby inhibiting histamine from binding. Patients experiencing a minor allergic reaction will be given

an antihistamine to block the histamine in the body from binding its receptors and causing a further reaction. (IX)

In cases where antihistamines are ineffective at abating the reaction, epinephrine is used. Epinephrine is a drug which attacks the histamine and blocks it from causing further histamine release by destructing mast cells, thus stopping the allergic reaction from progressing. (XIV) The reason why epinephrine would succeed at stopping a reaction in a case where histamine does not is that epinephrine attacks the histamine itself rather than its receptors. Epinephrine is also a chemical which constricts the blood vessels, allowing for proper blood flow thereby decreasing the symptoms associated with blood vessel swelling caused by histamine. Another symptom epinephrine abates is constriction of the lungs, allowing for relaxation of the airways and enabling the patient to restore their proper breathing pattern. Since Epinephrine is potent to the reaction, it is extremely potent in the physiological effect it has on the body as well. An elevated heart rate is generally correlated with administration of epinephrine. Therefore, because of the possible dangerous side effects of epinephrine one should seek medical assistance right after receiving the drug. (XV)

The “EpiPen” is the form in which epinephrine is most commonly administered. The “EpiPen” is a portable syringe of epinephrine which people with severe allergies carry at all times in case of an allergic reaction. From the time of diagnosis with an allergy, children and adults alike are taught how to use an Epipen since it can be vital to saving a life. (X) In the case of an anaphylactic reaction, one should administer one dose of the EpiPen and seek medical attention.

If the reaction has not ceased in response to the administration of the EpiPen, another dose can be administered before receiving medical attention.(XV)

Diagnosis

Allergies are generally diagnosed after a person has experienced an allergic reaction since the simplest way to diagnose a reaction is to have one. There are several forms of medical testing which can be done to diagnose an allergy. Patch testing is a form of diagnosis in which small samples of allergens are placed on patches which are subsequently attached to the patient. The patches remain on the patient over the course of a few days, in order to allow for the allergen to cause a reaction in the skin. If a sample is tested which is an allergen to the person, it will cause contact dermatitis around that patch. (XV) A similar method to patch testing is skin testing, where a sample of a suspected allergen is injected into the skin. If the skin above the injection appears raised or inflamed, the person is diagnosed with an allergy to the substance injected. A more accurate method of diagnosing an allergy is through blood testing where a sample of a person's blood is measured for allergen-specific antibodies. This is a more accurate approach since it measures the content of antibodies in the blood, a direct way to measure for IgE antibodies, rather than waiting for a possible reaction to occur. Also, patch and skin testing can both produce a false positive, finding that a person is allergic in a case where he or she is not, or a false negative, rejecting the allergy when he or she is allergic. This is because the methods of patch and skin testing involve other means of driving the body to react such as by irritating it with patches or an uncomfortable injection. Therefore, a more precise method in diagnosing an allergy is with a blood test.

After a person has not reacted to a patch or skin test or tested positive for allergen-specific antibodies, the final form of testing used is a food challenge. Food challenges are also conducted when it is suspected that a person has outgrown an allergy. In the food challenge, small samples of the allergen are given to a patient to consume over a series of a few hours. The patient is monitored for reactive symptoms in the presence of a medical professional in case of any adverse symptoms or reaction. The samples of allergens are alternated with placebo samples in order to ensure control for the accuracy of the test. Since the food challenge may trigger a reaction, special care needs to be taken by both the patient and medical professional while conducting this test. If no reaction occurs, then it is presumed that the allergen was either falsely diagnosed or the patient has outgrown the allergy. The food challenge is stated to be the most accurate and reliable form of testing for an allergy. (XIII)

Methods

The cause for the development of allergies is largely debated. The body's development of IgE antibodies which cause the allergic response can be attributed to either genetic factors, environmental causes, or a combination of the two. For example, if a certain patient is genetically predisposed to have a hyperactive immune system, then it is possible this patient can develop an allergy when exposed to it in the environment.

A significant factor in the debate on the origin of the development of allergies is the ability for a person to outgrow an allergy. MayoClinic states that between 60-80% of children outgrow their allergies upon reaching adulthood. (X) The fact that a person can outgrow an allergy supports the position that a person's environment can cause their allergy. This is because a person's environment can change throughout their lifetime allowing this person to outgrow his or her allergy. In contrast, if an allergy is genetic, then it would seem impossible for one to outgrow it, as one cannot change their genes. While it may be that a person can have a genetic predisposition to an allergy it is clearly impossible to fully place the cause for an allergy on genetics.

If there is a possibility for one to outgrow an allergy, then there must be a direct cause for the allergy in the first place. If one can determine the most likely cause for an allergy, then a person may be able to avoid developing an allergy all together, rather than waiting to outgrow it upon adulthood.

In researching the ways a person can prevent the development of an allergy, two factors have to be discussed. First, the global disparity of allergies among the populations of various countries needs to be outlined. If it is found that there is a global disparity among the population of people with allergies in different countries, then the second factor that needs to be determined is what the countries with low rates of allergies are doing differently than the countries with high rates. This will be conducted with the peanut allergy specifically.

Results

When assuming a global outlook on allergies, it is evident that there are countries with highly concentrated proportions of the population with allergies while other countries have eradicated the epidemic of allergies almost entirely.

One study supporting the above statement, summarized by the Journal of Allergy and Clinical Immunology, was conducted to determine the prevalence of allergies among Jewish children in the United Kingdom and Israel and to compare those numbers with each other. The reason the study utilized Jewish children in determining the rates of allergies is that the diets of Jewish children tend to be fairly similar no matter what country they live in, so this was a way to control for any confounding variables. Because the children regularly eat the same foods, the notion that some children were habituated to the allergic-foods due to external factors, other than the difference in the two countries, was rejected.

There were two questionnaires given to the parents of these school-aged children, one determining if their child had an allergy to peanuts and one which asked the parents how early peanuts were introduced into the child's diet. The results of the study found that the number of children with a peanut allergy was 10 times higher in the United Kingdom than in Israel, producing the following statistics: 0.17% of Israeli children were said to have a peanut allergy while 1.85% of their counterparts in the United Kingdom were said to have a peanut allergy. These differences were deemed significant highlighting the massive disparity in the prevalence of allergies, specifically the peanut allergy, between the United Kingdom and Israel. Interestingly

enough, in the second survey, the differences in the rates of consumption and introduction of peanuts into the diet showed a similar disparity. The Israeli mothers reported feeding their children about 8 times more peanuts as well as having introduced peanuts into the child's diet at an earlier stage than the mothers in the United Kingdom did. These numbers were deemed significant as well and may have contributed to the vast gap in reported allergies in the Israeli children and children of the United Kingdom. (VII) The numbers determined in the study are summed up in the graph below.

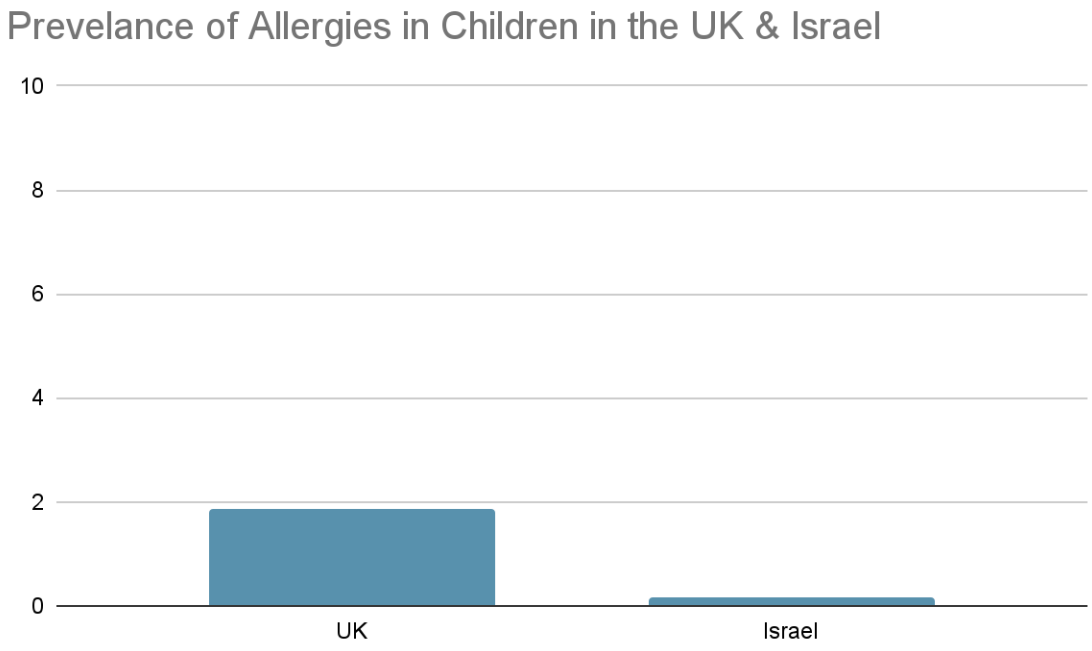

Figure 3. Prevalence of Allergies on a scale of 1-10 in UK & Israel

Similar studies to the one above have been conducted amongst children in the United States as well. These studies found similar numbers to the United Kingdom in the cases of young children in the US with allergies. According to the American Journal of Managed Care, in 2018 it was

reported that 2.5% of American children have a peanut allergy. [3] (V) Around the same time, the number of Israelis reported with a peanut allergy was 0.7% as found in the study discussed above. (VII) This difference, between 2.5% and 0.7%, in the prevalence of children in America and Israel with peanut allergies is even larger than the difference between the children in the United Kingdom and Israeli children with a peanut allergy. These major differences in the number of children with peanut allergies therefore is significant and clinically important. The disparity between the rates of American children with an allergy and Israeli children with an allergy may be correlated with American parents waiting until middle or late childhood to introduce their children to potential allergens because of the advice of physicians. [4]

Another study was conducted to determine the rates of allergies in Israel in comparison to the global population in general. This study compared the rates of atopic dermatitis, a symptom of allergies, in children among the global population. Atopic dermatitis is a skin condition where one develops a rash and red skin due to a variety of environmental or food allergens. The study found that Israel yet again had one of the lowest populations which were diagnosed with atopic dermatitis, connoting a low rate of allergic sensitivity. (VI)

As the aforementioned studies have established the disparity in the rates of peanut allergies in American and Israeli children, the following study provides context for what contributes to the elevated rates in peanut allergies in America.

[3] As this number was found a number of years ago, it is presumed to have increased.
[4] This is a result of the advice of the American Academy of Pediatrics (I)

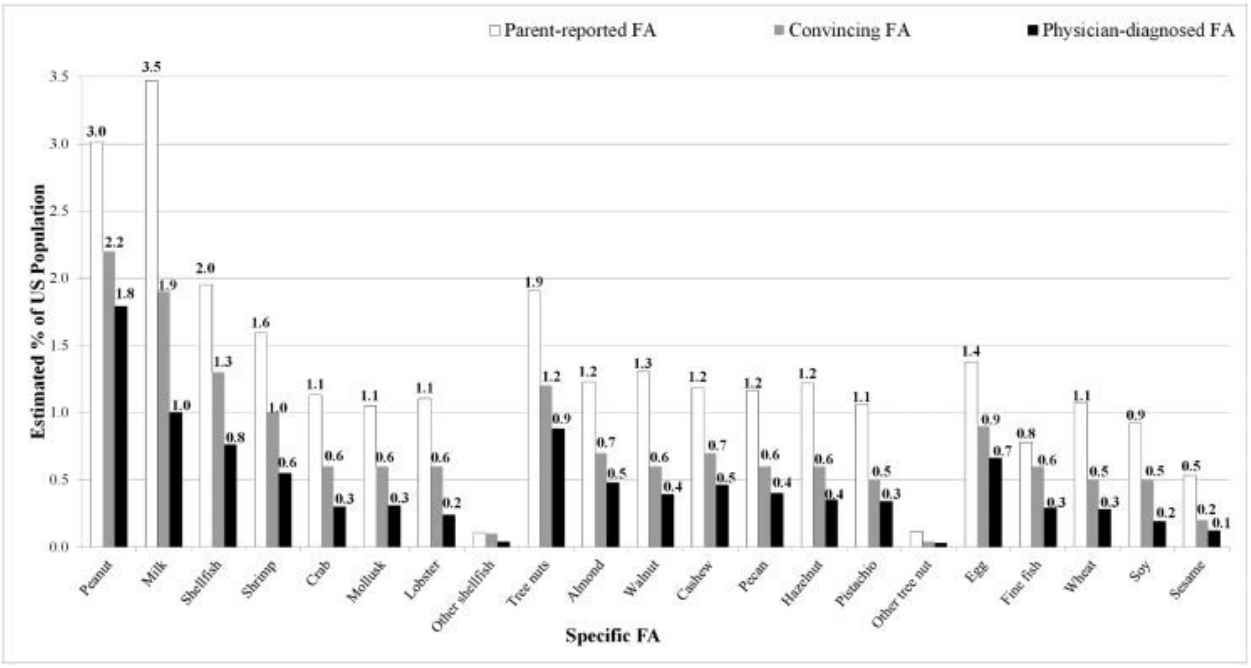

Figure 4. Parent Reported vs. Doctor Diagnosed Allergies in the United States [IV]

The figure above shows various food allergies and their correlating rates of parent-reported allergies, convincing food allergies[5], and physician-diagnosed food allergies in the United States. As illustrated in the figure, for all of the allergens shown the level of parent-reported allergies is higher than that of the physician-diagnosed in the same food category. For example, while 3.0% of children were reported by their parents to have a peanut allergy, only 1.8% of children were diagnosed with a peanut allergy. Though some differences are larger than others, this discrepancy in the reported prevalence of an allergy is significant as it also contributes to the elevated rates of American children with allergies.

[5] Meaning a person experienced at least one symptom characteristic of a severe allergic reaction

Discussion

The low rate of Israeli children with allergies is a result of the early introduction of allergens into the diet of Israeli children. One of the most common and popular snacks Israeli children eat is Bamba; a peanut-butter flavored corn puff. Israelis are also accustomed to eating tree nuts, which can be found in the children's snacks, chocolate, and pastries. Milk and eggs are also a regular part of a young child's diet in Israel. Sesame, another common allergen, is widely used in crackers and bread products in Israel so that is not either a common allergen for Israelis. Because these foods are a part of an Israeli child's diet early on, Israeli children's immune systems are familiar with these foods and do not develop a reaction towards them.

In contrast to Israel, American parents, as advised by physicians, do not give their children potential allergens until a later stage of development. (I) This advice was given because it was thought that the immune systems of babies and young children are still developing and thus are more inclined to react to innocuous substances. Although the case for protecting children from allergies is important, it seems that Americans may have been overestimating this danger and ultimately done their children a major injustice.

The overestimation of parents in the risk of allergies can be seen in Figure 4[6], which compares the rates of parent-reported allergies with physician diagnosed-allergies. There is a significantly large difference between the parent-reported allergies in comparison to the physician-diagnosed allergies specifically regarding the peanut allergy. This discrepancy is significant since it highlights the degree to which parents overdiagnose their children with allergies, specifically to

[6] Refer to Results Section

peanuts. The overdiagnosis amongst parents of their children having a peanut allergy shows that Americans have been taught to overestimate the risk of allergies due to the advice of the American Academy of Pediatrics to withhold potential allergens from the diet until late childhood. Americans have become ingrained with the idea that their children are likely to have allergies, so much so that it has resulted in the overdiagnosis of American children with allergies.

Because of this belief, Americans have become extremely worried about introducing potential allergens, specifically peanuts, into the diet of children. This idea, compounded with the fact that introducing allergens to the diet at a younger age prevents allergens, is correlated with the high rates of peanuts allergies in the American population. Because American parents do not allow their children to eat peanuts as young children, unlike their Israeli counterparts who grow up eating Bamba, more American children develop an allergy to peanuts.

Conclusion

Upon examination of the rates at which children have been diagnosed and are continually being diagnosed with a peanut allergy in America in contrast with Israel, there is clear indication that American parents are contributing to the elevated rates of peanut allergies in their children. The fact that Americans had been advised in the past by pediatricians to withhold potential allergens from the diet until a certain age is what began this steady rise in the prevalence of allergies amongst American children. The advice of the pediatricians produced a negative effect upon the

children whose parents were given these warnings as these parents began expecting peanut allergies, leading to an overestimation in their child having a peanut allergy.

In addition, Americans are already generally brought up in a sheltered environment where parents make sure to protect their children from as many harmful substances as possible. Compounding the warnings made by the American Academy of Pediatrics (I) with the general attitude of sheltering one's children from harmful substances, sustains this high level of peanut allergy diagnoses in American children.

Although the advice of the pediatricians was rescinded, it is extremely difficult to override a previously stated notion by pediatricians, but when examining the rates of allergy diagnoses in Israel, it is clear that Americans must do so. In order to bring down the levels of peanut allergy diagnosis in America, parents should introduce peanuts into the diets of children at an earlier age without worrying about a reaction occurring. Parents should also avoid self-diagnosing their children with a peanut allergy before seeking the advice and diagnosis of a doctor, since this contributes to elevated rates of peanut allergies.

Although it is difficult to eradicate previous advice from physicians, it is imperative to do so in order to bring down the levels of allergies among our population. It is our job to rid ourselves of the belief that certain foods are dangerous to give to young children, since the most dangerous thing is actually withholding these foods from them. Rather, parents should begin feeding children peanuts, as well as other allergens, from early childhood, in order to bring down the rates of American children with allergies. Parents should also avoid diagnosing their children

with a peanut allergy, since it both adds to the higher percentage of American children with a peanut allergy as well as furthers the notion that certain foods are dangerous to young children. Once parents have rejected the notion that peanuts are dangerous to young children, can the rising numbers of children with a peanut allergy be brought back down. By beginning to implement peanuts into the diet of young children, American parents can bring down the high level of peanut allergies in the American population.

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