

CHILDHOOD FOOD ALLERGY: PREVALENCE AND PERSPECTIVES

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Abstract: Hypersensitivity to food can be the reason for several complications in a child's development and, above all, create obstacles for first-time parents who do not have their skills well-polished yet. Thus, in order to better understand the proposed topic, 16 articles available in open access databases, such as SciELO, PubMed, Latindex and LILACS, were used. After a thorough analysis of the selected works, it was noted that the main food allergies in children are caused by milk, eggs and peanuts, in addition to observing an intrinsic relationship between genetic and environmental factors and the development of allergies. In summary, more investigations are needed on this subject, which is extremely important for the practice of medicine, not only in Brazil but throughout the world.

Keywords: Hypersensitivity; Foods; Children.

INTRODUCTION

An allergy is a response from the immune system to a factor that the body does not recognize as belonging to the organism itself. Among the various factors that can trigger this type of immune reaction, nutrition-related allergies have seen a large increase in cases in recent years, especially in Western countries (MARIÑO et al., 2018). Not only is there this increase, but it is also estimated that the presence of food allergies is 6 to 8% in children under three years of age and around 2 to 4% in adults (OLIVEIRA et al., 2018). In this scenario, studies show that approximately 90% of allergies are caused by eight main foods: milk, eggs, wheat, soy, peanuts, nuts, shellfish and fish (PETRIZ et al. 2020).

Upon contact with the body, it is essential that the immune system recognizes the food antigen as non-pathogenic (immunological tolerance process). The lack of tolerance to allergenic substances causes AA (BARNI et al., 2020). This hypersensitivity to food can cause allergic symptoms that range from

cutaneous symptoms (such as hives) to systemic symptoms (such as anaphylaxis).

Therefore, noting that the youngest section of society has the highest percentage of cases, the need for further studies on this topic is highlighted. Therefore, this work aims to unravel the aforementioned theme, through a bibliographical survey, in order to better understand childhood food allergy, as well as its prevalence in society.

METHODOLOGY

The present work is a study with a qualitative exploratory approach in secondary sources, through a bibliographic survey, to identify productions on the topic “Childhood food allergy: prevalence and perspectives”. The study identification and selection strategy were the search for publications indexed in open access databases, see SciELO, PubMed, Latindex and LILACS, in the month of January 2023.

The following criteria were used to select publications: original articles, literature review or experience report, articles with abstracts and full texts available for analysis. Included were those published in Portuguese, English or Spanish, between the years 2015 and 2024, and articles that contained the following descriptors in their title and/or body of text: “Hypersensitivity”, “Food” and “Children”.

Publications that did not meet the aforementioned inclusion criteria were excluded and, in the end, 16 articles were selected to compose the current review. The articles obtained in the survey were analyzed through thorough reading, highlighting those that responded to the objective proposed by this study.

FOOD ALLERGY

Food allergy (AA) consists of an exacerbated immunological response that appears after exposure to a certain food antigen (OLIVEIRA et al., 2018). The pathophysiology related to the development of hypersensitivity to food includes reactions mediated by immunoglobulin E (IgE), non-IgE-mediated or mixed reactions (PETRIZ et al., 2020).

In recent years there has been an increase in the prevalence of food allergies, which can be explained by changes in lifestyle and changes in the population's eating habits.

However, it is important that healthcare professionals know how to differentiate food intolerance and allergy, as the symptoms are similar and this can lead to overestimation of the diagnosis of allergies (OLIVEIRA et al., 2018). Unlike allergies, food intolerance concerns non-immunological problems, generated by physiological changes in the individual (MARIÑO et al., 2018).

The prevalence of food allergies declared by parents was around 10% of children in the United States, and the number has increased significantly in recent years (SAVAGE; JOHNS, 2015). However, according to Sicherer et al. (2020), determining the prevalence of AA is difficult due to the overestimation of self-reported allergy compared to that diagnosed in specific tests. According to Mariño et al. (2018), approximately 25% of parents report suspected food allergies in their children, however, the allergy is only confirmed in approximately 8% of cases.

Furthermore, according to Petriz et al. (2020), 90% of allergies are caused by 8 main foods: milk, eggs, wheat, soy, peanuts, tree nuts, shellfish and fish. All of them are widely present in the population's diet and excluding them from the diet directly impacts the health, quality of life and nutrition of individuals.

PATHOPHYSIOLOGY

The pathophysiology of food allergy as measured by IgE involves the processing of food antigens in intestinal lymphoid tissue (GALT), where they are presented and stimulate macrophages and regulatory T cells to produce immune tolerance. (MARINO et al., 2018). In patients with food hypersensitivity, sensitization occurs upon first contact with the allergen, which culminates in an immune response that breaks the individual's immunological tolerance to this antigen, inducing the production of specific IgE (DE MARTINIS et al., 2020).

In this scenario, in future exposures, IgE binds to specific receptors on the surface of mast cells, releasing chemical mediators that induce vasodilation, edema and contraction, depending on the location where the mast cells are located.

Other cells, such as CD4 T lymphocytes, can participate in mixed allergy, producing interleukins IL-4 and IL-13 that act in the allergic process, especially in chronic manifestations (PÉREZ-ARMENDÁRIZ et al., 2021).

Non-IgE-mediated allergies do not have a well-described mechanism, but a relationship with CD4 T cells and TNF α production is suggested. The main one is Food Protein-Induced Enterocolitis Syndrome (FPIES), a distinct AA, which often produces only gastrointestinal symptoms such as reflux, diarrhea and vomiting. Among mixed allergies, the main one is allergy to cow's milk protein (TURNBULL; ADAMS; GORARD, 2015).

RISK FACTORS

Simply exposing children to allergens is not enough to increase the incidence of the disease. The epidemiology of AA depends on the relationship of several risk factors that, when studied, can assist in preventive actions

for the individual (SOLÉ et al., 2018).

Among the risk factors for this pathology, the presence of atopy (exaggerated immune reaction mediated by IgE antibodies) in the family stands out as a strong predictor for the development of AA. A study demonstrated that the risk of food allergies increased by around 40% in children who had a family member with an allergy (SAVAGE; JOHNS, 2015).

According to Sicherer et al. (2020), AA results from several genetic and environmental factors that affect food tolerance. Regarding genetics, studies with monozygotic twins demonstrated a greater concordance with peanut allergy than among dizygotic twins, a fact that demonstrates the heritability of this allergy. Likewise, Franco et al. (2022) state that the risk of developing peanut allergy can increase seven times in children whose father, mother or sibling is affected by the disease, with the risk being 64% higher in monozygotic twins whose sibling is allergic. However, it is worth highlighting that genetic factors alone are not enough to justify the increase in the prevalence of AA.

In relation to environmental factors, nutrition in early childhood plays an important role in the prevention and management of food allergies. In this scenario, socioeconomic conditions and social practices during breastfeeding can increase the prevalence of AA in different groups (DUPUIS; PHIPATANAKUL; BARTNIKAS, 2023). Thus, low-income families have limited access to safe, non-allergenic foods. Furthermore, low parental education and lack of adequate care during childhood are also important risk factors.

In this context, the importance of exclusive breastfeeding up to the sixth month of life and a supplementary diet (with breast milk and balanced and balanced foods) up to two years of age or older is highlighted to ensure

health and prevent allergies in childhood, since breast milk secretes IgA that blocks food antigens and regulates immunity, favoring food tolerance (SOLÉ et al., 2018).

Furthermore, according to Savage and Johns (2015), having older siblings and pets can reduce the chances of developing allergies due to the protective effect that microbial stimulation produces in childhood. Other factors such as the type of birth, exposure to smokers and contact with other microorganisms also affect child development from intrauterine life, generating epigenetic changes that impact the immunological balance and can predispose the emergence of allergies (MARIÑO et al., 2018).

MILK ALLERGY

Milk allergy is the most common at the beginning of life, affecting around 50% of children during the first year, 40% in the second year and 30% in children aged 3 to 5 years (SICHERER et al., 2020).

According to Flom and Sicherer (2019), milk allergy can cause anaphylactic reactions and impact child nutrition and growth. Milk is a food whose evaluation is difficult, as it includes non-IgE and mixed reactions, as well as non-immunological reactions (such as lactose intolerance) that make statistical analyzes difficult.

According to Turnbull, Adams and Gorard (2015), around 15% of cases show signs of immediate hypersensitivity and symptoms of anaphylaxis (IgE-mediated), while a similar proportion have symptoms of gastroesophageal reflux and diarrhea, which are symptoms of allergies. not mediated by IgE.

The resolution rate can reach 50% at 5 years of age and up to 75% in adolescence, with tolerance being greater in those with a lower baseline IgE level. Those with more severe reactions and other associated atopic diseases

do not have such high levels of success in developing tolerance (FLOM; SICHERER, 2019).

This allergy generally develops in the first year of life and has a good prognosis, and hypersensitivity can be overcome by the beginning of adolescence in most cases. Furthermore, food is usually better tolerated if it is eaten cooked, that is, boiled (SAVAGE; JOHNS, 2015). Similarly, according to Flom and Sicherer (2019), the main allergens in cow's milk include alpha-lactalbumin and beta-lactoglobulin, which have their allergenic potential reduced when heated, increasing the individual's tolerability capacity.

EGG ALLERGY

One of the most prevalent food allergies in childhood is egg allergy, which affects around 1.6% of the population and develops mainly during the first year of life, similar to milk (SAVAGE; JOHNS, 2015). According to Caffarelli et al. (2022), the prevalence can reach 2.9% at 2 years of age, with egg white being the main element responsible for exacerbating the immune response.

Studies show that cooking this food reduces its allergenic potential, with a resolution rate of up to 50% in six years (SAVAGE; JOHNS, 2015). Accordingly, Caffarelli et al. (2022) state that the allergy usually resolves in up to 60% of cases by the age of 12, with this number rising to 94% when eaten cooked.

On the other hand, according to Vilar et al. (2020), the proteins that cause the allergic response in eggs have different physical and chemical characteristics, so the thermal process acts differently on each of them and it is not possible to predict the tolerability that each individual will have to the food cooking process.

PEANUT ALLERGY

On the other hand, peanut allergy does not have a favorable course similar to the aforementioned foods. The prevalence is estimated at 2% and, although it usually develops up to 18 months, it can appear later in childhood or even adulthood. Unlike eggs and milk, only about 20% of people who develop peanut allergies usually develop tolerance later (SAVAGE; JOHNS, 2015).

It is important to be careful with contaminated surfaces, as peanut allergens can remain in the environment for days or even weeks after contact with the objects. Thus, the need to disinfect surfaces before eating is reinforced (TURNBULL; ADAMS; GORARD, 2015).

DIAGNOSIS, CLINICAL MANAGEMENT AND PREVENTION

According to De Martinis et al. (2020), AA symptoms can be divided into the initial phase, which is acute, functional and capable of rapid reversal; and late phase, which have slower reversal. The main symptoms are: hives, erythematous rash and red skin; acute bronchospasm; acute gastrointestinal spasms; fainting, cramps and, in systemic cases, can cause anaphylaxis (SOLÉ et al., 2018).

Diagnosis involves understanding the immune mechanisms, clinical history and tests performed. A mistaken diagnosis can cause serious social and nutritional damage to the child's development (MARIÑO et al., 2018). Having a detailed clinical history is important, but it is not enough to diagnose food hypersensitivity in isolation. The clinic is essential to identify the probable cause, guide the choice of tests and study the possibility of cross-reactions with food (TURNBULL; ADAMS; GORARD, 2015).

As a diagnosis, in vivo tests, such as the skin prick test, or in vitro tests, such as the

measurement of specific IgE, can be used, which are effective, cheap and safe methods (BARNI et al., 2020). However, the positive results are not specific for food allergies, with around 50% of sensitive patients able to tolerate the food without reactions (PETERS et al., 2021). Still according to Barni et al. (2020), a negative test has 90% reliability to exclude an allergy, while a positive test can only indicate a state of sensitization, and not confirm an AA.

Another widely used test is the oral food challenge (OFC), which can be performed as a double-blind placebo-controlled food challenge (DBPCFC), considered the gold standard in diagnosing food allergy. However, it is a highly complex test and subjects the patient to high risks of anaphylaxis (DE MARTINIS et al., 2020).

AA treatment is based on antigen avoidance, as there are no curative treatments yet. However, avoiding foods imposes nutritional restrictions that impact the child's health and can lead to food insecurity (PETERS et al., 2021). Avoiding food with the allergen is important to prevent sensitization from consolidating and to avoid new reactions, but it is also important to educate the patient and family to prevent accidental ingestion and formulate an adequately nutritious diet to supply the restricted foods (MARIÑO et al., 2018).

AA management also includes preparation for accidental exposures, involving a multidisciplinary team, written information and emergency plans. For possible exposure, the patient must wear an identification bracelet and always have an injection of adrenaline with them. Companions must receive an action plan to recognize the warning signs and instructions for applying adrenaline, which must not be delayed under any circumstances (TURNBULL; ADAMS; GORARD, 2015).

In addition to these protocols,

immunotherapy strategies are being developed to help desensitize patients with AA. This treatment aims to stop the immunological response against the antigen or increase the dose necessary to reach the reaction threshold, in order to provide greater protection to the patient and provide a better quality of life (DE MARTINS et al., 2020).

Regarding prevention, there is no evidence that the early introduction of cow's milk-based foods provides protection for children. However, the use of probiotics and exclusive breastfeeding until six months of age constitute relevant protective factors to prevent the development of AA (FRANCO et al., 2022).

CONCLUSION

In conclusion, an intrinsic relationship was noticed between genetic and environmental factors and the development of AA in children, the latter being crucial in the prevention of AA, as they can influence both the development

and the expression and management of these allergies.

When comparing the articles that made up the integrative review, it was found that milk and eggs are considered the main foods related to childhood atopy, especially if undercooked. Regarding the development period of AA, eggs and milk are the most related to atopy in the first year of life, unlike peanuts, which usually appear in later years and few people tend to obtain tolerance.

In short, the present work showed that food hypersensitivities represent a significant challenge for children and their families, requiring a multidisciplinary approach that encompasses education, awareness and collaboration between healthcare professionals, the patient and family members. Finally, the importance of future studies is highlighted, as well as advances in research and clinical practice, given their relevance to the medical field and to ensuring a better quality of life for children and society in general.

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