



Food Allergy in Children: Etio-Pathogenesis, Treatment and Prevention Methods

Devorova Marifat Bakiyevna

Candidate of Medical Sciences, Associate Professor of the Department of Physical Education and Medical Supervision, Tashkent Pediatric Medical Institute

Mavlyanova Dilbar Adizovna

Assistant of the Department of 'Family Doctor №1, Physical Education and Civil Defence' at Tashkent Pediatric Medical Institute

Abstract: Food allergies in children are specific immunological reactions and clinical symptoms resulting from ingestion of allergens from food or cross-exposure. The disease is manifested by dermatological (rash, itching), respiratory (nasal congestion, runny nose, sneezing) and gastrointestinal signs (abdominal pain, nausea and vomiting, unstable stools). Skin prick tests, clinical and immunological blood tests, provocation tests are used for diagnosis. Elimination diets and drug therapy are prescribed for the treatment of food allergy in children.

Key words: food allergy, children, etiology, pathogenesis, treatment, prevention, allergens.

Introduction: Food allergy is one of the most common problems of paediatrics, which, according to different data, is detected in 8-30% of children. The disease is most commonly diagnosed in infancy and early childhood and between 7-10 years of age. The problem is least common between 3-7 years of age. Boys and girls are equally susceptible to the effects of food allergens. Changing dietary patterns and more exogenous antigens entering the body cause a further increase in the incidence of food allergy.

Causes

The etiological factors of the disease are various food components to which the body produces antibodies. There is a phenomenon of cross allergy, when the presence of sensitisation to plant pollen or animal hair is accompanied by intolerance to certain foods. For the development of pathology, predisposing factors must also be present:

- Genetic prerequisites. It is established that more than 50% of patients with food allergy have a hereditary predisposition to atopic diseases. This is controlled by 4 groups of genes that are transmitted independently of each other, so a child can have absolutely any combination of them.
- Antenatal exposures. This includes extragenital diseases of the woman and pathologies of the course of pregnancy, which negatively affect the foetus. A significant risk factor is the presence of bad habits in the pregnant woman. Irrational nutrition of the future mother and the use of a large number of allergic products also increase the likelihood of disease in the child.
- Postnatal factors. These include pathological births, which reduce the adaptive capabilities of the body and increase the risk of sensitisation from the mother. Food allergy occurs more often in children who were on artificial feeding or started too early (up to 6 months) to receive complementary foods.



- Functional disorders. At an early age, children have an underdeveloped system of digestive enzymes that break down protein antigens and prevent them from entering the body. Local intestinal immunity is also inactive, which increases the likelihood of allergen penetration.

Pathogenesis

The most frequent allergens for children are cow's milk, eggs, nuts, soya, wheat, fish. The main pathogenic components of such foods are water-soluble glycolipids. These are small molecules that are resistant to the action of thermal processing, the influence of digestive enzymes. Therefore, they enter the child's body in unchanged form, leading to specific immunological reactions.

The main immunological mechanism of food allergy is the reactin type of tissue damage (type I). Its essence lies in the interaction of food allergens with immunoglobulins, resulting in the activation of mast cells (basophils). They release into the surrounding tissues histamine, other biologically active substances that cause characteristic symptoms. Less common are delayed sensitisation reactions (type IV).

Sensitisation to allergens occurs both through the gastrointestinal membranes and through the mucosa of the respiratory tract. In the first case, the natural protective barrier of the intestine is breached, as a result of which foreign proteins enter the blood. Inhalant allergens are predominantly plant pollens. They stimulate the formation of IgE, which can react with certain substances from food, causing cross food allergy.

Classification

According to the number of products that provoke undesirable symptoms, monovalent sensitisation is distinguished, which is only 20-30% and polyvalent food allergy. In 79% of cases, the disease is combined with sensitivity to other types of allergenic substances (dust, plant pollen, medications). According to pathogenesis, IgE-dependent and IgE-independent forms are distinguished. In addition to these classifications, paediatricians subdivide the disease into 3 types:

- Type A - allergy in newborns and young children, which is associated with impaired barrier function of the digestive tract and lack of oral tolerance.
- Type B - pathology of younger schoolchildren and adolescents, when sensitisation predominantly occurs via the respiratory tract, and food allergy develops by a cross-talk mechanism.
- Type C - a rare type that is diagnosed in adolescents (more often - girls) without predisposition to atopy or other risk factors.

Symptoms

All manifestations of food allergy in children are divided into typical and atypical. The first include lesions of the respiratory system and skin (occur more often), digestive system (observed less often). This course of the disease differs from adults, in whom the GI tract is usually affected. Atypical signs include symptoms of the urinary, cardiovascular, nervous and musculoskeletal systems.

The first sign of food allergy is usually abnormal skin changes. Rashes have the form of flat red spots or papules that rise above the skin. The rash is often accompanied by desquamation and excruciating itching. Lesions are mainly located on the face and neck, in the area of the elbow bends, forearms and hands. In repeated episodes of food sensitisation, rashes are localised in the same areas.

Respiratory manifestations occur with involvement of the upper respiratory tract. Children have nasal congestion, repeated sneezing, copious watery discharge. Less often bothers the throat and coughing. Such symptoms are characteristic of infants and children up to three years of age. In preschoolers and younger schoolchildren prevails defeat of the bronchopulmonary system - attacks of dyspnoea, suffocation.

Allergic inflammation of the GI tract is characterised by polymorphism of symptomatology. Infants have frequent regurgitation, vomiting, intestinal colic and flatulence. Enterocolitis is characterised by



liquid stools with mucus and blood. At an older age, food allergy runs like gastroenteritis - the child complains of pain and cramps in the stomach, nausea and heaviness in the abdomen after eating, stool instability.

The speed of development of the clinical picture is determined by the type of immunological reactions. In type I, pathological symptoms are detected immediately or in one or two hours after the consumption of a prohibited product, and in type IV from ingestion to allergic manifestations can take up to 2 days, which complicates diagnosis and delays the start of treatment. The duration of symptoms - from 1-2 to 10 days, which is determined by the severity of the disease, the amount of allergen eaten.

Complications

The danger of food allergy is that without treatment it is the first step in the so-called 'allergic march'. First, against the background of sensitisation to products, the child develops atopic dermatitis, after which the disease passes to the next stage - the lesion of the respiratory organs in the form of allergic rhinitis. In the absence of treatment, the 'march' reaches the third stage, when bronchial asthma manifests itself.

Prolonged undiagnosed pathology is accompanied by allergic lesions of the joints and increases the risk of rheumatoid arthritis. The most severe manifestation of food allergy is anaphylactic shock. The condition is more characteristic of newborns, infants. Symptomatology appears within 1-3 minutes after contact with the allergen. Bronchospasm, laryngeal oedema, collapse begin, which, without treatment, can lead to death.

Diagnosis

Timely detection of food allergy for treatment is a challenge in paediatric allergology-immunology due to the diversity of immunological mechanisms and the high frequency of cross-reactions. The diagnostic search begins with a questioning of the parents and the child: how long ago the symptoms began, what is associated with their appearance, and whether there are risk factors in the family. To establish the fact of food allergy, laboratory tests are carried out:

- Skin tests. A simple and safe test that detects sensitisation to the main types of allergens. It is performed at any age, but in patients under 2 years of age, the doctor may get distorted results due to underdevelopment of skin reactivity. The presence and degree of reaction are assessed by the size of redness and oedema after the prick test.
- Haemogram. To detect pathology, the child performs a provocation test: give an allergenic product and immediately prescribes a blood test. If there is hypersensitivity, the results will show a decrease in the level of leukocytes (more than 1000) and platelets (by 20% or more), and the level of eosinophils will increase.
- Immunological methods. In clinical allergology, the diagnosis of the level of total IgE and specific IgE-antibodies is of great importance. The study has an accuracy of more than 95% and is decisive in the diagnosis of food allergy, especially if the results of other tests are doubtful.

In the diagnostic search, an elimination method is used: certain foods that can cause allergies are excluded from the food diet and the child's well-being is monitored. If pathology is present, compliance with the diet without any treatment leads to an improvement in the condition. If indicated, the doctor recommends consultation of related specialists - paediatric gastroenterologist, pulmonologist, dermatologist. Specialists can offer additional laboratory and instrumental studies.

Treatment of food allergy in children

Diet therapy

The basis of treatment is formed by special elimination diets. They are designed to control allergy symptoms, prevent complications and stabilise the condition. The diet is selected based on the age of



the patient, the severity of the disease and the amount of prohibited products. In modern paediatrics, there are 2 main types of diet therapy for the treatment of food allergies in children:

- Nonspecific hypoallergenic diet. In this case, all products are divided into three groups according to the degree of allergenicity (high, medium and low). Foods from the first category (eggs, cow's milk, citrus fruits, etc.) are completely excluded from the diet and the number of foods with a medium degree of allergenic activity is limited.
- Individualised elimination diet. The menu is selected after a complete diagnosis and identification of products, at the consumption of which the child begins unpleasant symptoms. The main types of diets: dairy-free, with the exclusion of eggs, with the refusal of cereals. Other dietary options are also possible, especially in polyvalent food allergies.

The prescription of dietary therapy in children includes 3 consecutive stages: selection of nutrition, which takes 3-10 days, a period of strict adherence to restrictions, the stage of dietary expansion, which is carried out on average after 12-18 months. This approach of modern treatment protocols shows high efficiency: in 43% of patients clinical manifestations of food allergy disappear on the 5th-7th day, in 11% - after 2 weeks, in 23% - after 1 month from the beginning of therapy.

Selection of diet in infants has its own peculiarities. Given that the most common cause of food allergy during this period is cow's milk proteins, the baby needs a transfer to therapeutic formulae. Specialised baby food contains protein hydrolysates, which do not have allergic properties. The disadvantage of the mixtures is their bitter taste, because of which it is sometimes necessary to switch to soya protein formulations.

Conservative therapy

In addition to dietary therapy, treatment regimens for food allergies include medications. The main group of drugs approved for use in children are antihistamines. They are prescribed during the period of exacerbation of the disease to quickly remove allergic inflammation and improve the patient's condition. With a moderately severe course, drugs in the oral form of release are indicated, and at the peak of exacerbation, first-generation agents in the form of parenteral solutions are used for treatment.

Another category of medications - enterosorbents. They effectively bind excess food protein allergens in the GI tract and remove them from the body, reducing the degree of intoxication. In severe forms of food allergies and the development of 'march' in treatment regimens include topical and systemic glucocorticoids, mast cell membrane stabilisers, antileukotriene drugs.

Prognosis and prevention

With early detection of allergic factors and their exclusion from the diet, there is a full recovery. Compliance with dietary recommendations can prevent relapses of the disease. As oral tolerance increases, some children recover spontaneously, which is confirmed by statistics: among adults, only 1-3% suffer from true forms of food allergy (compared to 8-30% in children).

To reduce the risk of allergic manifestations in children, it is necessary to limit the influence of allergens on the body as much as possible. Prevention consists of two stages:

- Antenatal stage. It includes rational nutrition of the pregnant woman, prescription of elimination diets for women who have an aggravated allergological anamnesis.
- Postnatal stage. It involves exclusive breastfeeding until 6 months of age, which gives the child antigenic protection, as well as the introduction of complementary foods based on the principles of evidence-based medicine, if necessary - milk mixtures.

LITERATURE:

1. Alimentary prevention of food intolerance in newborns and breastfed children of the first year of life/ V.A. Tutelyan, I.Y. Kon, E.M. Fateeva et al. - Moscow, 2005 - 14 p.



2. Allergic diseases in children: peculiarities of cytokine and immune status/ E.V. Prosekova, V.V. Derkach, T.N. Shestovskaya and dp.il Immunology.- 2007.- Vol. 28.- No. 3,- P. 157-161.
3. Belitskaya M.Y. Treatment of allergic skin lesions in children of the first year of life, being. Available Online at: <https://www.scholarexpress.net> Volume-31, February 2024 ISSN: 2749-3644 on natural feeding / M.Y. Belitskaya P Rossiiskiy vestnik perinatologii i pediatriiia.-2005.- No. 2.- C. 45-47.
4. Borovik T.E. Modern dietotherapy in allergic diseases in young children/ T.E. Borovik, V.A. Revyakina, S.G. Makarova, O.L. Lukoyanova// Russian Allergological Journal.- 2006.- No. 1.- P. 39-46. 39-46.
5. Balabolkin I. I. Modern concept of pathogenesis and principles of therapy of allergic diseases in children // Paediatrics. -M., 2003. -№4. -С. 52-57.
6. Balabolkn I-I. Bronchnallia asthma in children M. Medicine, 2003. С. 34-46. 277-279
7. Плына N.I. // Russian Journal of Allerology. -2004. V' I P.37-41.
8. I.I. Ryumina, M.M. Yakovleva, Rus med journal, 19(3), 146-149 (2011).
9. Деворова М.Б. , Номозов Ф.Т// Лихорадка неясного генеза у детей”. Материалы XVII научно-практической конференции молодых ученых и студентов ГОУ “ТГМУ им. Абуали ибни Сино” с международным участием, Том 1,29 апреля 2022 г. Душанбе (Dushanbe) 112-113с.
10. Деворова М.Б., Шомансурова Э.А., Улугов А.И.// Особенности физического развития дошкольников с аллергическими респираторными заболеваниями. №2 Педиатрия журналы 2022 йил июль
11. Деворова М.Б. Current aspects of treatment and complications of covid in children with allergic diseases(literary review) World Bulletin of Public Health (WBPH).Журналы Scholar Express. Available Online at: <https://www.scholarexpress.net> Volume-22, May 2023.Берлин , Германия 33-36 стр.
12. Devorova M.B., Mavlyanova Dilbar Adizovna// Current Problems and Methods For Prevention of Allergic Pathology in Children. Volume: 04 Issue: 05 | Sep-Oct 2023. ISSN: 2660-4159 стр.806-809