

## PHYSIOLOGICAL AND PATHOGENETIC BASIS OF THE ORIGIN OF ALLERGY TO COW'S MILK PROTEINS IN CHILDREN

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**Annotation:** Allergy to cow's milk proteins in children is a complex of immune-mediated reactions from the gastrointestinal tract, skin and respiratory system caused by intolerance to milk proteins. The disease first appears in the first half of the baby's life. The main symptoms are vomiting, colic and intestinal disorders, and various skin rashes. Deterioration of health is associated with the use of cow's milk and products based on it. Diagnosis is based on anamnestic data, the results of immunological tests and a trial diet. Treatment involves strict restriction of the allergen in the diet for a period of 6 months, taking into account the dynamics of the disease.

**Key words:** milk, protein, symptom.

Cow's milk protein allergy (ABCM) is a common variant of a food allergic reaction in young children. When interviewing parents and analyzing clinical manifestations, the frequency of occurrence reaches 10-15%, but according to laboratory diagnostics, ABCM affects no more than 2-3% of infants. The significant role of the disease in modern pediatrics is due to polymorphic symptoms, difficulties in selecting a rational scheme for feeding an infant, and the risk of developing other allergic diseases in the future.

Among all cow's milk proteins, beta-lactoglobulin, casein, alpha-lactalbumin, and bovine serum albumin are the most common sources of immune responses. The first two proteins are thermally stable, so heat treatment does not reduce their allergenic potential. Others are considered thermolabile and are dangerous in their raw form. The following factors contribute to the formation of allergies to cow's milk proteins in children:

- Artificial feeding. Breast milk is a physiological and less allergenic source of nutrients, compared to formula milk, even if they have a carefully thought-out composition. Among infants who mainly eat mother's milk, the incidence of the disease is 0.5-1.5%, among "artificial" children - from 2% to 5%.
- Hereditary predisposition. Innate features of the immune response to foreign substances determine the risks of atopic diseases. If one of the parents suffers from any form of allergy, the probability of developing ABCM in the child is 20-35%. When both parents are ill, this indicator increases to 40-60%.
- Exogenous factors. Sensitization to other food and household allergens increases the likelihood of ABCM. The mechanism is explained by cross-allergic reactions and mainly occurs in children with a hereditary predisposition. Risk factors also include living in ecologically unfavorable regions with a large amount of atmospheric pollution.

ABCM causes degranulation of mast cells, release of bioactive substances, and an inflammatory process in the intestinal wall. The circulation of immune complexes causes systemic allergies affecting the skin, respiratory tract and other organs. According to the mechanism of development, an allergy to milk proteins is divided into 2 types. The first type is associated with immunoglobulins E (IgE), the second is caused by complement reactions, other types of antibodies and T cells.

The appearance of ABCM in breast-feeding is due to the ability of antigens to affect mother's milk. When a nursing woman consumes cow's milk products, components of their proteins from the intestinal lumen enter the lymphoid nodules (Peyer's plaques), where they activate T

and B lymphocytes. Then the activated cells migrate through the blood vessels and can reach the mammary glands, after which they enter breast milk.

Allergy to cow's milk proteins can be immediate or delayed. In the immediate type, clinical manifestations occur shortly after consuming dairy products. With delayed reactions, symptoms of the disease develop after several hours or even days. In practical pediatrics, the pathogenetic classification is also used, according to which ABCM is divided into 2 groups:

- -mediated IgE. This category includes systemic anaphylactic reactions and local clinical manifestations: gastrointestinal, respiratory, skin.
- -IgE-mediated Not. This type of allergy includes atopic dermatitis, Gainer's syndrome, a wide range of gastrointestinal pathologies: allergic eosinophilic esophagitis, colic, constipation.

#### Symptoms

Allergy to cow's milk proteins in children is characterized by a polymorphism of symptoms, involving at least two organ systems in the pathological process. All children have signs of dyspeptic disorders: frequent regurgitation and vomiting, diarrhea or constipation, a large amount of mucus in the bowel movements. Allergic reactions are the cause of 15% of cases of persistent infant colic, which causes the baby to constantly cry, push and groan, and sleep poorly.

Skin symptoms are represented by atopic dermatitis, which is manifested by dense red plaques, constant itching, thickening and peeling zones in the chronic course of the disease. Urticaria is also possible – itchy pink blisters that occur shortly after drinking milk. Respiratory signs include a runny nose, stuffy nose, shortness of breath, and wheezing. In some infants, the allergy is accompanied by conjunctivitis.

#### Complications

A serious danger is an immediate type of allergy. With angioedema, the pathological process can spread to the larynx, causing asphyxia. Anaphylactic shock is manifested by a sharp drop in blood pressure and depression of consciousness, without emergency help, it ends in death. In non-IgE-mediated allergies, severe enterocolitis with metabolic acidosis and a shock-like reaction is possible.

The development of allergy to cow's milk proteins in children is considered as the first stage of the atopic march. ABCM is diagnosed in 85% of infants with manifestations of atopic dermatitis, which in the future is supplemented by sensitization to respiratory antigens and the development of allergic rhinitis. With a combination of unfavorable factors, such a child develops bronchial asthma over time. Up to 18% of patients with asthma are intolerant to milk proteins.

#### Diagnostics

Symptoms suspected to be related to food allergies require an in-depth examination by a pediatrician or pediatric allergist. To make a diagnosis, an analysis of anamnestic data is necessary: the nature of feeding, the presence and composition of complementary foods, the time of occurrence and severity of clinical manifestations. An important role is played by the family history, especially the mother's nutrition during breastfeeding. The following methods are used to verify the diagnosis::

- Allergy skin tests. they are informative for detecting IgE-mediated allergic reactions. They are performed in children from 6 months of age, using cow's milk protein antigens and other common types of food allergens to determine polyvalent immune responses. Redness, itching and blisters in the test area indicate the presence of allergies.
- Immunological tests. For the diagnosis of IgE-mediated variants of the disease, studies of specific class E antibodies are prescribed. Other types of disease are determined by the results of the basophil activation test, leukotriene release analysis, and other highly sensitive techniques.

- Diagnostic dairy-free diet. Exclusion of dairy products is a universal method used to confirm any type of ABCM. For immediate reactions, 7-10 days of follow-up is sufficient, delayed allergic manifestations require diagnosis within 2-4 weeks. If multiple food allergies are suspected, a strict elimination diet is prescribed.
- A provocative test. The introduction of an allergen in the form of a double-blind placebo-controlled trial is the world's "gold standard" for confirming the diagnosis in complex cases. This method is not certified in Russian clinical guidelines. It can be replaced by the diagnostic introduction of the product in a minimal amount.

#### Differential diagnosis

When making a definitive diagnosis, it is necessary to exclude other types of food reactions: lactase deficiency, lipase deficiency, gluten enteropathy (celiac disease). Differential diagnosis is carried out with food toxicoinfection, non-immune reactions to foreign pollutants in dairy food. AKBM is also differentiated with conditions that are not related to food: functional dyspepsia, inflammatory bowel diseases.

An elimination diet is the main way to control allergic symptoms. An individual diet is selected for the child, taking into account the type of feeding, the type of ABCM, the intensity of clinical manifestations and other factors. In standard cases, diet therapy is prescribed for 6 months, after which a second clinical assessment is carried out and the question of expanding the diet is decided. Severe forms of ABCM require a special diet for 1-1.5 years.

When an infant is breastfed, an elimination diet is prescribed for the mother. A woman should stop consuming milk, all types of dairy products and beef dishes. The results are evaluated after 2-3 weeks. Normally, the child's condition improves: the work of the digestive tract is normalized, skin symptoms decrease or completely disappear. If the treatment does not work, consider switching to a specialized mixture.

Children on artificial and mixed feeding are prescribed therapeutic milk mixtures with highly hydrolyzed proteins. In such products, proteins undergo fermentation, ultrafiltration, and heat treatment. The molecules have a minimal size and low allergenic potential, so they do not cause symptoms of ABCM. In severe cases, mixtures based on amino acids are used, which have high digestibility, quickly correct the malabsorption syndrome.

#### Drug therapy

In acute allergic manifestations, antihistamines of the 2nd generation are used. They are prescribed in short-term courses to stabilize the child's condition. Long-term use is not recommended due to numerous side effects. For skin care, you will need emollients and other hypoallergenic cosmetics with gentle formulas that will not aggravate dermatological symptoms.

#### Experimental treatment

Scientists are developing a method of allergen-specific immunotherapy (ASIT) for children with ABCM. It involves a gradual dosed exposure to the allergen to form a tolerance to cow's milk proteins. The complexity of treatment is due to the low evidence base and conflicting safety data. Along with studies on the effectiveness of immunotherapy, there are reports of adverse reactions and worsening of allergy symptoms.

#### PROGNOSIS AND PREVENTION

Many cases of allergy to cow's milk proteins resolve independently with age, so if you follow a diet in infancy, the outcome of the disease is favorable. 85% of babies develop a strong protein tolerance by the age of three. By the age of 6, most children consume dairy products without problems, except in cases of polyvalent allergies and the progression of atopic march. Special prevention is indicated for children with a burdened family history. If possible, only breast-feeding is carried out up to 4-6 months of age. If the mother has allergic diseases, she needs to follow an individual hypoallergenic diet. No other dietary restrictions are

required. For children receiving milk formula, choose formulations based on partially hydrolyzed protein.

**Literature:**

1. Allergy to cow's milk proteins in infants-the place of antihistamines / T. N. Surovenko, N. F. Glushkova// Medical Council. - 2020. - No. 18.
2. Allergy to cow's milk proteins in children. Clinical recommendations of the Russian Union of Pediatricians. – 2018.
3. Formation of food tolerance in children with allergies to cow's milk proteins / G. A. Novik// The Attending Physician, 2014, No. 6.
4. Kazyukova T. V. Allergy to cow's milk proteins: a strategy for choosing therapeutic nutrition // Effective pharmacotherapy. Pediatrics. – 2013. – №3