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THERAPY OF BRONCHIAL ASTHMA IN CHILDREN

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Therapy for bronchial asthma is aimed at restoring bronchial patency, achieving stable remission and maximizing pulmonary function and ensuring the normal development of the child. This can be achieved as a result of a set of measures, including increasing the level of knowledge of parents and patients about the manifestations and possibilities of treatment of bronchial asthma, controlling the course of the disease by eliminating trigger factors, conducting pharmacotherapy and allergen-specific immunotherapy [1,2].

Key words: bronchial asthma, therapy, treatment, immunity.

Parents of children suffering from bronchial asthma are not sufficiently informed about the mechanisms of development, manifestations of this disease and existing approaches to its treatment, which is sometimes the reason for their low activity in the implementation of therapeutic programs. Improving parent and child knowledge may improve the effectiveness of treatment for children with asthma. Educational programs for family members include coverage of such issues as the nature of bronchial asthma, factors that provoke exacerbation of the disease, methods of use and possible side effects of the medications used. Parents are explained what medications are used to relieve an attack of bronchial asthma and to prevent subsequent exacerbations of the disease, in which cases patients with bronchial asthma need hospitalization and where they can receive emergency and specialized care.

Preventive measures are aimed at reducing exposure to causally significant allergens and preventing the impact of other nonspecific factors that cause exacerbation of the disease. It is essential to eliminate pets from living quarters, stop smoking in the family, and implement measures aimed at reducing the concentration of aeroallergens in the apartment. Detection of a connection between exacerbations of

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bronchial asthma and the consumption of certain foods requires the appointment of an elimination diet. If a drug allergy is detected, it is necessary to exclude the use of medications that cause the development of side effects.

Treatment of acute bronchial asthma is carried out taking into account the severity of the exacerbation of the disease, which is assessed on the basis of examination, pulmonary function tests, X-ray examination, and blood gas composition studies (for severe exacerbations of asthma).

Objective information about the severity of bronchial obstruction is provided by determining PEF (peak expiratory flow), the decrease of which in bronchial asthma is in direct correlation with the severity of the attack that occurs. The value of PEF in the range from 50 to 80% of the proper values indicates moderate or mild impairment of bronchial obstruction. PEF indicators less than 50% of the required values indicate the development of a severe exacerbation of bronchial asthma.

Determining blood oxygen saturation can be quite informative in assessing the patient's condition. A decrease in blood oxygen saturation to less than 92% indicates that the patient has severe bronchial obstruction. In case of severe exacerbations of bronchial asthma, it is advisable to conduct an X-ray examination of the lungs, which allows identifying atelectasis, pneumomediastinum, and an inflammatory process in the lungs.

To eliminate an attack of bronchial asthma, inhaled beta2-adrenergic agonists (salbutamol, fenoterol, terbutaline) are most effective [3]. Relief of an attack begins with the prescription of drugs from this group of bronchospasmodics. Inhaled beta2-adrenergic agonists have powerful bronchospasmolytic activity and ensure the development of a therapeutic effect within 10-20 minutes. after use. Sympathomimetic drugs can be administered using metered-dose inhalers, which make it possible to strictly control the aerosol dose. You can use inhalers for the administration of dry bronchospasmolytic powder, nebulizers for the inhalation administration of liquid symptomatic medications (fenoterol, salbutamol). The administration of beta2-adrenergic agonists in the form of metered-dose aerosols is

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most effective in children over 7 years of age who are able to fully master the technique of their use. In children of primary and preschool age, treatment with metered aerosols is carried out using a spacer. The administration of solutions of beta2-adrenergic agonists using nebulizers is more often used in young children and in patients with severe exacerbations of bronchial asthma, when due to the severity of the condition they cannot inhale the drug.

To relieve an attack of bronchial asthma, 2 inhalations of a metered-dose aerosol with one of the beta2-agonists are usually prescribed with an interval of 2 minutes. Inhalation can completely stop an attack of bronchial asthma or significantly reduce its manifestations. In cases of incomplete disappearance of symptoms of bronchial obstruction, inhalation of the drug is carried out every 4-6 hours until bronchial patency is completely restored.

If the therapeutic effect from the use of inhaled beta2-adrenergic agonists is insufficient, aminophylline can be prescribed orally at a dose of 4 mg/kg body weight 4 times a day. The use of the bronchospasmolytic drug Berodual, containing fenoterol and ipratropium bromide, can be effective. It is advisable to carry out Berodual therapy in young children and in patients with a severe attack of bronchial asthma using a nebulizer. To relieve mild attacks of bronchial asthma, oral use of sympathomimetics (salbutamol, terbutaline, clenbuterol), as well as aminophylline, is possible.

For severe attacks of bronchial asthma, nebulizer therapy with inhaled beta2-adrenergic agonists or Berodual is carried out in combination with nebulizer therapy with a budesonide suspension (Pulmicort) at a dose of 250-500 mcg 2 times a day. For patients in whom this therapy is not effective enough, glucocorticosteroids are administered intramuscularly. Prednisolone or methylprednisolone is prescribed at a dose of 1-2 mg/kg, hydrocortisone at a dose of 5-7 mg/kg body weight. Betamethasone (Celeston) at a dose of up to 3.5 mg or triamcinolone at a dose of 0.3 mg/kg body weight may be more effective.

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In case of a developing asthmatic condition, nebulizer therapy with beta2-adrenergic agonists or berodual is prescribed every 4 hours, nebulizer therapy with budesonide is administered, glucocorticosteroids are administered (prednisolone or methylprednisolone at a dose of 2 mg/kg for the first administration and 2 mg/kg per day for the subsequent one, or hydrocortisone at a dose of 7 mg/kg for the first and 7 mg/kg per day for subsequent administration, or dexamethasone at a dose of 0.3 mg/kg for the first and 0.3 mg/kg per day for subsequent administration). If nebulizer therapy with bronchospasmolytics is ineffective, infusion therapy with aminophylline is performed. A loading dose of the drug (5-7 mg/kg) is administered intravenously by drip over 20 minutes, then a constant infusion is used: for children with a body weight of less than 10 kg at a dose of 0.65 mg/kg every hour and for children with a body weight of more than 10 kg at a dose of 0.9 mg/kg every hour until the patient recovers from the asthmatic state. A loading dose of aminophylline is not administered if, before prescribing infusion therapy with aminophylline, the patient was treated with methylxanthine drugs. Long-term infusion therapy with aminophylline should be carried out under the control of determining the concentration of theophylline in the blood serum, which allows maintaining optimal therapeutic concentrations of the main active substance in the blood and avoiding side effects. If severe exacerbation of bronchial asthma develops, a short (3-7 days) course of oral therapy with prednisolone at a dose of 1-2 mg/kg per day can be administered.

If severe respiratory failure occurs, characterized by the involvement of auxiliary muscles in the respiratory act, the appearance of a paradoxical pulse, and chest hyperinflation, more frequent (every hour) inhalations of beta2-adrenomimetics are performed; with a rapid increase in respiratory failure, inhalation of these drugs is carried out three times every 15-20 minutes. or adrenaline is administered subcutaneously at a dose of 0.01 mg/kg (but not more than 0.3 ml) three times with an interval of 15-20 minutes between administrations, while oxygen therapy is

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carried out. In cases of ineffectiveness of this treatment and the development of a threat of asphyxia, the patient is transferred to artificial ventilation.

During the period of exacerbation of bronchial asthma, the administration of bromhexine, thermopsis and ipecac decoctions helps to improve the drainage function of the lungs. Sufficient fluid intake in the form of drinking also contributes to the removal of sputum in asthmatic patients. If a bacterial infection develops in the lungs, antibiotic therapy is administered.

The goals of anti-relapse therapy are to achieve clinical remission of the disease with maximum improvement in pulmonary function and improve quality of life. The basis of preventive therapy for asthma in children is anti-inflammatory therapy, which can reduce bronchial hyperactivity. Cromoglycic acid (Intal), nedocromil sodium (Tyled), and inhaled glucocorticosteroids have anti-inflammatory activity.

In children with mild bronchial asthma, anti-relapse therapy is carried out by prescribing cromones (cromoglycic acid or nedocromil sodium) and, if necessary, adding short-acting inhaled beta2-adrenergic agonists when symptoms of the disease occur. Treatment with cromoglycic acid (inhalation of intal powder or aerosol) is carried out for 3-6 months, it is possible to administer solutions of this drug (cromohexal) through a nebulizer. Treatment with cromones is considered as first-line therapy in children with mild asthma.

Anti-relapse therapy is also started with the prescription of cromones in children with moderate bronchial asthma. If such patients develop symptoms of bronchial asthma, short-acting inhaled beta2-adrenergic agonists are prescribed. To prevent nocturnal attacks of bronchial asthma, such patients can be prescribed slow-release oral dosage forms of theophylline (teopek, theotard, neoteopek, etc.); Durant theophylline preparations are prescribed in a daily dose of 12-16 mg/kg body weight in 2 divided doses. If this therapy is insufficiently effective in patients with moderate bronchial asthma, leukotriene receptor antagonists (zafirlukast sodium, montelukast sodium) can be introduced into the complex of therapeutic measures. Zafirlukast

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sodium (acolat) is used in children over 12 years of age, 20 mg 2 times a day. Montelukast sodium (Singular) is prescribed once a day: children from 6 to 14 years old, 5 mg, adolescents over 15 years old, 10 mg. For moderate bronchial asthma and the ineffectiveness of non-steroidal anti-inflammatory therapy, patients are prescribed inhaled glucocorticosteroids: beclomethasone dipropionate (becotide), budesonide (pulmicort), fluticasone propionate (flixotide). To stabilize the condition of patients with moderate bronchial asthma, it is usually sufficient to prescribe average daily doses of inhaled glucocorticosteroids. Thus, the average daily dose of beclomethasone for this group of patients ranges from 400 to 800 mcg. The addition of inhaled glucocorticosteroid therapy in most cases allows stabilizing the condition of children with moderate bronchial asthma. The use of spacers contributes to increasing the flow of inhaled glucocorticosteroids into the lungs. Their use reduces the incidence of candidal infections in the pharynx and larynx, which sometimes occurs as a complication during treatment with these drugs. The duration of therapy with inhaled glucocorticosteroids should be at least 3-6 months. When combined with inhaled glucocorticosteroids and durable beta2-agonists, a higher therapeutic effect is achieved. The administration of combination drugs containing glucocorticosteroids and long-acting beta2-sympathomimetics, for example, seretide (fluticasone + salmeterol) or symbicort (budesonide + formoterol), allows treatment with lower doses of glucocorticosteroids and reduces the risk of possible side effects during treatment with them.

In patients with severe bronchial asthma, treatment with inhaled glucocorticosteroids can be started with high doses, for example beclomethasone dipropionate in a daily dose of 800-1200 mcg. Inhaled glucocorticosteroids such as fluticasone propionate and budesonide have the highest anti-inflammatory activity. Long-term, up to 6 months, use of inhaled glucocorticosteroids can stabilize the condition in most patients with severe asthma. When remission is achieved, the dose of drugs is gradually reduced to maintenance and treatment is continued. When prescribing high doses of inhaled glucocorticosteroids to children with severe

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bronchial asthma, clinical remission can be achieved somewhat faster than when prescribing medium doses, however, with subsequent continuation of treatment, there are no differences in the course of the disease in children receiving high and medium doses of these drugs. In children with severe bronchial asthma, the duration of continuous treatment with inhaled glucocorticosteroids should be at least 6 months. In patients with hormone-dependent bronchial asthma, the use of inhaled glucocorticosteroids allows either to cancel the maintenance dose of systemic glucocorticosteroids or to reduce it. If necessary, treatment with inhaled glucocorticosteroids can be carried out for 1-2 years or more. For the treatment of severe bronchial asthma, combination drugs containing fluticasone and salmeterol, as well as budesonide and formoterol are most often used. If necessary, leukotriene receptor antagonists and durant theophyllines may be included in the treatment of children with severe asthma. The use of these drugs can increase the effectiveness of the treatment.

Achieving sustainable clinical remission in patients with bronchial asthma is facilitated by allergen-specific immunotherapy. When carried out with allergens Dermatophagoides pteronyssinus, Dermatophagoides farinae, pollen, bacterial allergens and fungal allergens, a positive result is recorded in 73.3-87.5% of children with bronchial asthma, while both parenteral and non-invasive methods of allergen-specific immunotherapy (endonasal, sublingual) [1]. Allergen-specific immunotherapy is more effective in cases of bronchial asthma caused by monovalent sensitization.

In children suffering from bronchial asthma with concomitant recurrent and chronic bronchopulmonary infection, chronic hepatitis, chronic pyelonephritis, pustular skin infection, when identifying signs of immunological deficiency, the use of immunomodulators can be effective [4].

Prevention of exacerbations of bronchial asthma caused by the addition of acute respiratory diseases of viral and bacterial etiology is facilitated by the use of immunomodulatory drugs of bacterial origin (bronchomunal, ribomunil, IRS 19) [5].

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The use of broad-spectrum antiallergic drugs (ketotifen, loratadine, cetirizine) over a course of 2 months or more helps to reduce the frequency and severity of exacerbations of bronchial asthma, reduce the symptoms of concomitant allergic rhinitis, skin and gastrointestinal allergies.

The effectiveness of treatment of bronchial asthma in childhood is increased by the implementation of individually designed physical recovery programs based on massage, physical therapy and sports.

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