



## **OPTIMIZATION OF RECURRENT THERAPY BRONCHOBSTRUCTIVE SYNDROME IN CHILDREN**

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### **Abstract:**

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The results of anamnestic, conventional clinical laboratory and special examination methods in 40 children with recurrent broncho-obstructive syndrome were studied. The efficacy of Montelukast sodium in bronchial obstruction was determined depending on the severity of clinical and instrumental data.

**Keywords:** recurrent course of broncho-obstructive syndrome in children.

**RELEVANCE.** Respiratory diseases occupy the leading place in the structure of childhood morbidity. A pediatrician has to deal daily with broncho-obstructive syndrome (BOS), since its signs appear in more than half of young children. The growth trend in children with acute respiratory diseases (ARI), often occurring with a clinic of obstructive bronchitis, which takes a protracted, undulating and recurrent course in every third child, with the possibility of subsequently developing bronchial asthma, as well as a variety of immune disorders, determine the relevance of studying the mechanisms of recurrence formation [ 3, 8, 14, 19, 21].

The involvement of the allergic component (bronchospasm) in the genesis of the obstructive syndrome during recurrence of obstructive bronchitis in children is confirmed by the presence of a aggravated anamnesis and allergic manifestations, high levels of IgE and specific antibodies similar to those in children with bronchial asthma [2, 6, 13, 22]. In the mechanisms of recurrence of bronchial obstruction, not only allergic mechanisms are important, but also inflammation caused and maintained by the bacterial flora. Undoubtedly, the reproduction of microorganisms in violation of local protective mechanisms activates the inflammatory process [4, 11, 12, 20].

An important place in the pathogenesis of the development and maintenance of inflammation and bronchial obstruction in children is occupied by leukotrienes, prostaglandins, inflammatory mediators, disorders of receptor mechanisms, characterized by an increase in the ratio of alpha1/alpha2-adrenergic receptors, activation of M-cholinergic receptors, and stimulation of the functional activity of leukotriene and H1-histamine receptors [5 , 7, 23]. Leukotrienes containing cysteine can cause mucus production, edema, eosinophilia, and bronchial obstruction.

Leukotriene-mediated inflammatory response can be prevented by blocking the CysLT1 receptor (removing the site of action of leukotrienes).

The results of the studies indicate late negotiability and diagnosis of recurrent, incl. obstructive bronchitis in children, which is the cause of untimely therapy and poor prognosis.

In this regard, the treatment of acute obstructive bronchitis in different age periods should be carried out taking into account the pathogenesis of the formation of bronchial obstruction. The main directions in the treatment of bronchial obstruction in acute respiratory infections include the improvement of bronchodilator and anti-inflammatory therapy [1, 9, 10, 18].

Despite numerous works devoted to broncho-obstructive syndrome in children, the assessment of severity is controversial, and differentiated approaches to therapy are not well developed. Treatment tactics are constantly being improved in accordance with modern ideas about the mechanism of inflammation and bronchial obstruction, new drugs are being searched to optimize therapy. The drug Montelukast sodium is an active compound that binds with high selectivity and chemical properties to CysLT1 receptors and blocks cysteinyl leukotriene receptors in the respiratory tract. The drug was used as a prophylaxis and long-term treatment of obstructive syndrome occurring against the background of allergies. Given the versatility of the pathogenetic mechanisms of the infectious and inflammatory process in the bronchi, along with etiotropic therapy, anti-inflammatory treatment is required to influence the factors that support the recurrence and chronicity of the process [6, 8, 17]. There are studies on the use of leukotriene receptor antagonists in the treatment of acute bronchitis with obstructive syndrome, however, no work was found on the prevention of bronchial



obstruction occurring with relapses and chronic bronchitis, which determined the purpose of our study.

**PURPOSE OF THE WORK:** to show the effectiveness of the use of the drug Montelukast sodium in the complex therapy of biofeedback for the prevention of recurrence of obstructive bronchitis in children.

**MATERIAL AND RESEARCH METHODS.** Under our supervision were 40 children with recurrent BOS at the age of 1 to 5 years, hospitalized in the departments of emergency pediatrics of the Samarkand branch of the Republican Scientific Center for Emergency Medical Care.

According to the goal and objectives, the patients were divided into two groups: 20 children with recurrent obstructive bronchitis who were on traditional therapy (group I) and 20 children who received Montelukast sodium in complex treatment in addition to traditional therapy (group II), which belongs to selective leukotriene receptor blockers. The drug specifically blocks the cysteinyl leukotriene receptors LTS<sub>4</sub>, LTD<sub>4</sub> and LTE<sub>4</sub>, which are powerful mediators of chronic persistent inflammation that maintains bronchial hyperreactivity. Montelukast sodium has a pronounced anti-inflammatory effect, prevents bronchial constriction. In the diagnosis, clinical, laboratory and special research methods were used, including a detailed specification of the characteristics of cough and microbiological examination of sputum, followed by differentiation, and the choice of optimal therapy was made taking into account the characteristics of the onset, development and mechanisms of the pathological process.

**RESULTS AND ITS DISCUSSION.** The clinical characteristics of the observed patients was based on the study of the influence of the development of relapses of bronchial obstruction, the severity of the course and the dynamics of the disease. The reason for hospitalization in the department in 75.0% of cases was an exacerbation or recurrent course of the process in the bronchopulmonary system, in 25.0% of children - an acute infectious-inflammatory process.

When comparing therapeutic efficacy, a clinical observation of the course of biofeedback in 40 children was carried out. Patients were admitted to the department on the 2.7±0.6 day of illness. The criteria for hospitalization of patients included: an unfavorable premorbid background, the presence of concomitant diseases, an RDAI score of ≥4 points, a score of SSHO ≥5 points, the risk of developing a complicated course of the disease, ineffectiveness of treatment at home

during the first three days. Studies have shown that 92.3% of patients were admitted with bronchial obstruction and DN of varying severity. Most of the patients were admitted in moderate to severe condition. The average age of hospitalized patients was 3.3±0.4 years. The peak incidence of recurrent obstructive bronchitis fell on the age group of 2-5 years. Cough in 52.5% of children was productive, unproductive was in 42.5% of patients and 5.0% was absent at admission.

When the process recurred, the appearance of sputum depended on the severity and duration of the disease. In 57.5% of sick children with a history of allergic diseases, sputum had eosinophils, of which 20.0% had a yellowish sputum. In 17.5% of cases, sputum had a greenish tinge with a predominance of neutrophil-lymphocytic inflammation. Leukocytes were present in the sputum of all patients. In 67.5% of sick children, there were fibrous films in the sputum, indicating concomitant diseases. In the microbiological study of sputum of patients with recurrent obstructive bronchitis, pneumococci (60.0%) and streptococci (30.0%) were in the lead, and pneumococcal infection was detected in most cases in young children. Streptococci are more common in children 5-7 years of age (25.0%).

Patients received therapy with Montelukast sodium from the first day of hospitalization until complete relief of biofeedback. The drug was prescribed for children weighing up to 10 kg - 2 mg, for children weighing 10-45 kg - 4 mg per 1 dose at bedtime for 7-10 days. In group I, on the 3rd day of hospitalization, severe BOS (9-12 points according to W.Tal) persisted in 6 (15%) patients, moderate (5-8 points) - in 12 (30%) children and mild (2-4 points) - in 2 (5%) cases. In group II, in patients receiving Montelukast, severe BOS was observed in 4 (10%) children, moderate - in 9 (22.5%) patients, and mild BOS was present in 7 (17.5%) cases. Comparative evaluation of capillary blood PO<sub>2</sub>, heart rate/respiratory rate ratio before and after the first doses of the drug showed that positive dynamics in the disappearance of signs of DN was observed in both groups of patients, however, in patients of group II it was more pronounced and stopped faster when taking Montelukast sodium.

The dynamics of the disappearance of the main clinical symptoms in patients of group I was studied in comparison with indicators of group II (in days). Comparative analysis showed that in children of the 1st group, the improvement in the general condition occurred on the 5.5±0.2 day of the disease, while in the 2nd group, when taking Montelukast on the 4.8±0.2 day, cyanosis of the skin and mucous



membranes disappeared, respectively. on days  $3.6 \pm 0.2$  and  $2.9 \pm 0.3$ , the temperature returned to normal on days  $3.4 \pm 0.2$  and  $2.7 \pm 0.2$  of hospitalization, a decrease in the intensity of cough followed by its disappearance was observed on 5,  $8 \pm 0.2$  and  $4.5 \pm 0.3$  days of hospital stay.

The condition of the child, along with a clinical examination, was daily assessed according to the studied parameters: the scale of respiratory disorders - RDAI (12), the saturation method - SpO<sub>2</sub>, the developed saturation-scale assessment - SSS (14), calculated by the formula:  $SSS = (95 - SpO_2) + RDAI$ , which made it possible to reliably assess the severity of respiratory disorders in bronchial obstruction.

Analysis of physical changes in the lungs, which are the most manifest symptoms of acute bronchial obstruction, showed that if, on the background of traditional therapy, percussion changes in the lungs returned to normal on day  $4.4 \pm 0.2$  and auscultatory data on day  $5.2 \pm 0.3$ , then in the montelukast group, a significantly ( $P < 0.02$ ) accelerated improvement in these parameters was observed - by  $3.2 \pm 0.2$  and  $4.1 \pm 0.3$  days. Relief of respiratory failure in patients receiving a complex of traditional therapy was manifested at  $3.6 \pm 0.2$  days, cardiac activity returned to normal at  $2.4 \pm 0.3$  days, which, in comparison with the indicators of group II, showed a significant improvement in these parameters when using the drug Montelukast sodium (respectively  $2.4 \pm 0.2$  and  $2.0 \pm 0.2$  days  $P < 0.01$ ). Expiratory dyspnea, which is one of the pathognomic signs of broncho-obstructive syndrome, stopped on average by  $3.5 \pm 0.3$  days, which is 1.4 days faster in group II compared to group I. Complex therapy of patients of group II with the inclusion of the drug Montelukast sodium led to the end of treatment to the standard values of the parameters of redox processes (pO<sub>2</sub> of capillary blood, the ratio of heart rate/respiratory rate). Comparative analysis of the dynamics of SSS indicators shows that the use of Montelukast sodium in group II had a more pronounced clinical and laboratory effect than in group I. The relief of clinical symptoms of respiratory disorders and the restoration of saturation indicators were observed from the 3rd day of therapy. The effectiveness of Montelukast sodium in comparison with traditional therapy was observed on the 4.5th day of the disease (in group I -  $1.6 \pm 0.3$  points, in group II -  $1.2 \pm 0.3$  points;  $P < 0.01$ ) and on day 5.9 (group I -  $1.5 \pm 0.2$  points and in group II  $0.9 \pm 0.2$  points;  $P < 0.01$ , respectively  $P < 0.01$ ).

Discharge criteria were: satisfactory condition, RDAI score of 4 points or less, SpO<sub>2</sub> of 95% or more.

The inclusion of Montelukast sodium in the therapy in the complex of traditional treatment was manifested by a decrease in the length of stay of patients in the hospital by an average of 1.2 bed-days, while in patients of group II  $4.3 \pm 0.2$  bed/days, compared with patients Group I ( $5.5 \pm 0.2$  bed/days) ( $P < 0.05$ ). In our observations, no adverse side effects were observed when using Montelukast sodium at the above dosage, which corresponded to a sufficient level of drug safety.

**CONCLUSIONS.** The results of the study indicate the clinical efficacy of Montelukast sodium as part of complex therapy in children and its recommendations for use to prevent the development of a recurrent course of obstructive bronchitis.

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