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ANTAGONISTS OF LEUKOTRIENE RECEPTORS IN THE TREATMENT OF MILD AND MODERATE BRONCHIAL ASTHMA IN YOUNG CHILDREN

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Abstract

Bronchial asthma (ba) belongs to the common allergic diseases in childhood.

Despite the achievements in the diagnosis and treatment of ba, there is still a trend toward an increase in incidence and a more severe course of ba in children starting from early age.

from the point of view of modern concepts, ba in children is an allergic inflammation of the airways accompanied by bronchial hyperreactivity to various stimuli.

Keywords

respiratory tract diseases in children, bronchial asthma, asthma in children, pediatrics

Diseases of the respiratory system that develop in childhood have the greatest share in the overall morbidity structure. it is well known that children who frequently suffer from respiratory diseases constitute a high-risk group for the development of lower respiratory tract infections, including their obstructive forms. most episodes of bronchial obstruction in children during the first 3 years of life occur against the background of acute respiratory infections. it should be noted that since bronchial obstruction in early childhood associated with viral infections is обусловлена anatomical and physiological features, it may be transient in nature and often disappears by the age of 6.

However, recurrent episodes of obstructive syndrome are one of the main risk factors for decreased lung function. repeated episodes of respiratory diseases accompanied by bronchial obstruction, as a rule, form or aggravate bronchial hyperreactivity. international guidelines (gina, 2006; practall, 2008), as well as the russian national program “bronchial asthma in children: treatment strategy and prevention” (2012), note that asthma in children, regardless of severity, is a chronic inflammatory process in the airways, and to control the course of the disease it is necessary to use drugs with anti-inflammatory activity that act on both acute and chronic inflammation.

About 70% of children with bronchial asthma have mild to moderate forms of the disease. it is precisely such cases that pediatricians and pulmonologists/allergists encounter daily in their practice. to prevent the development of severe asthma and disability in children, it is necessary to develop adequate treatment regimens aimed at timely diagnosis and correction of bronchial reactivity disorders. currently, the national program “bronchial asthma in children: treatment strategy and prevention” recommends a stepwise approach to basic therapy for various forms of asthma in children, taking into account severity, age, and drug delivery method. for mild asthma, the use of non-steroidal anti-inflammatory drugs, low doses of inhaled glucocorticosteroids (ics), as well as leukotriene receptor antagonists as monotherapy (montelukast) is recommended. in

moderate asthma, therapy with these drugs is also possible, mainly in combination with ics. several studies have demonstrated the effectiveness of montelukast sodium (singulair) in virus-induced asthma phenotype observed in young children.

Группы наблюдения		Применяемые препараты	Число наблюдений, n		Средний возраст, M ± m
Первая	1а	Монтелукаст натрия (Сингуляр)	123	37	3,07 ± 0,2
	1б	Кромогликат натрия		86	3,29 ± 0,09
Вторая	2а	ИГКС	115	73	3,58 ± 0,45
	2б	Монтелукаст натрия (Сингуляр) + ИГКС		42	3,33 ± 0,17

Montelukast sodium is a selective antagonist of cysteinyl leukotriene receptors. it is prescribed for children starting from the age of two years at a dose of 4 mg once daily in the evening in the form of a chewable tablet. the advantages of montelukast sodium include convenience and ease of use (chewable tablet form), as well as once-daily dosing.

At the university children's clinical hospital of the i.m. sechenov first moscow state medical university, the clinical and functional effectiveness of montelukast sodium was studied as monotherapy and in combination with other basic drugs (ics) for the treatment of asthma in children under 5 years of age. it was shown that the use of montelukast sodium (singulair) in basic therapy improves the course of the disease and reduces the frequency and duration of bronchial obstruction episodes. the possibility of using computer bronchophonography (cbpg) to assess lung function in young children with asthma for monitoring bronchial patency was demonstrated.

A total of 238 children aged 2 to 5 years were observed, including 98 girls and 140 boys. depending on the type of therapy, the children were randomized into two groups similar in age and demographic characteristics. the first group consisted of patients with mild persistent asthma and was divided into two subgroups: subgroup 1a received montelukast sodium (singulair) as monotherapy (4 mg once daily in the evening), while subgroup 1b received sodium cromoglycate as basic monotherapy. the second group included patients with moderate asthma and was also divided into two subgroups: subgroup 2a received inhaled glucocorticosteroids (ics) as monotherapy, while subgroup 2b received montelukast sodium (singulair) in combination with ics.

The effectiveness of therapy in different groups was assessed based on clinical symptoms and lung function parameters measured by cbpg, including visual graphical characteristics and mathematically calculated absolute values of the acoustic component of respiratory work (acr) in microjoules. cbpg assessment was performed using a bronchophonographic diagnostic automated system. respiratory sounds were recorded using a highly sensitive sensor capable of detecting a wide frequency range, including frequencies not detected by auscultation but of diagnostic importance. the device was developed in 1976 (author: prof. v.s. malyshev et al.), and in 1981, studies of acoustic characteristics of respiratory sounds in various bronchopulmonary pathologies initiated further development of cbpg.

Respiratory wave scanning was performed in the frequency range from 0.2 to 12.6 khz, with three frequency zones identified: low (0.2–1.2 khz), medium (>1.2–5.0 khz), and high (>5.0 khz). cbpg allows evaluation of the intensity of respiratory acoustic phenomena associated with increased airflow turbulence (acr). the method records a time curve of respiratory noise with subsequent mathematical processing. lung function was monitored before therapy and after 3 months of treatment. In group 1 patients, exacerbations occurred 6–8 times per year; in 61.78% of cases they were triggered by viral infections, in 43.1% by physical exertion, in 4.88% by strong odors, and in 1.62% no triggers were identified. symptoms included dyspnea (70.73%), cough (58.54%), and nocturnal cough (22.76%). attacks were relieved by bronchodilator inhalations within 3–5 days; no maintenance therapy was used. baseline cbpg showed slightly elevated acr values.

After 3 months of therapy, there was a reduction or absence of bronchial obstruction episodes, decreased need for bronchodilators (to 2 ± 1 days), and in some cases single use only. clinical symptoms decreased, and in 54.47% of patients no obstruction episodes were observed. cbpg showed normalization of high-frequency acr values and significant reductions in both high- and medium-frequency ranges. In group 2 (moderate asthma), exacerbations occurred 10–18 times per year, mostly triggered by viral infections and physical activity. symptoms included dyspnea, asthma attacks, cough, nocturnal cough, and wheezing. despite ics therapy, cbpg showed persistent abnormalities and incomplete disease control in subgroup 2a. In subgroup 2b (ics + montelukast), after 3 months there was a reduction in obstruction episodes, decreased bronchodilator use, and improvement in clinical symptoms. cbpg demonstrated significant improvement in both high- and medium-frequency acr values, approaching normal levels.

No adverse effects of montelukast sodium chewable tablets were observed in any group. Thus, montelukast sodium, a leukotriene receptor antagonist, can be effectively used as basic monotherapy in children with mild persistent asthma. its use for 3 months reduces bronchial obstruction episodes and normalizes lung function. in children with moderate persistent asthma, combination therapy with ics significantly improves disease control and prolongs remission. cbpg is a useful method for monitoring lung function and evaluating treatment effectiveness in young children with respiratory diseases.

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