



Modern Concepts About Recurrent Bronchitis in Children (Literature Review)

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ABSTRACT

In recent years, there has been an increase in the incidence of respiratory pathology, including recurrent and chronic respiratory diseases [2,5,11,14]. Thus, according to the scientists of Uzbekistan and world statistics, acute bronchopulmonary diseases account for 36% in the structure of general morbidity in children and 51% in the cause of infant mortality [11,17].

Keywords:

In recent years, there has been an increase in the incidence of respiratory pathology, including recurrent and chronic respiratory diseases [2,5,11,14]. Thus, according to the scientists of Uzbekistan and world statistics, acute bronchopulmonary diseases account for 36% in the structure of general morbidity in children and 51% in the cause of infant mortality [11,17].

The prevalence of recurrent bronchitis (RB) is 16.4 cases per 1000 children [17]. Out of 1,000 children, 40-50 people aged 1-3 years suffer from them, 75-100 people - 4-6 years old and 30-40 people - 7-9 years old. In ecologically unfavorable areas, pathology is much higher. Thus, at the age of 3-6 years, it is 5-6 times higher than in favorable areas, reaching 250 cases per 1000 children [5,14,17]. According to modern concepts, RB is a multifactorial, eco-dependent disease, the leading pathogenetic link of which is recurrent inflammation of the mucous membrane of the bronchial tree, due to a decrease in local protective factors and general immunological

resistance of the body, in response to infectious, allergic, toxic, physical and neurohumoral effects, which form the hyperreactivity of the respiratory tract [11,13].

The modern classification emphasizes that recurrent bronchitis occurs, as a rule, in children of the first 4-5 years of life. According to many authors, this nosology is most often registered at the age of up to 7 years [5,11]. Repeated episodes of acute bronchitis, diagnosed 2-3 or more times a year, mainly against the background of respiratory viral infections, are defined as RB. Clinical and radiological manifestations during the period of the disease correspond to the signs of acute bronchitis [2,11,13,17]. Currently, there is a consensus on the leading role of infection in the development and exacerbation of RB [1,6,12]. Of the infectious factors, viruses (95% of cases) and viral-bacterial associations are of the greatest importance in the etiology of bronchitis. In second place in importance is the bacterial nature of the disease (pneumococcus, Haemophilus influenzae), then fungi and

protozoa, and in some cases may be due to atypical flora (mycoplasma, chlamydia, legionella, pneumocystis) [3,10]. Among the viruses, respiratory syncytial (RS) viruses and adenoviruses take the leading place. Less commonly, viruses such as influenza and parainfluenza viruses, enteroviruses, measles virus, cytomegaloviruses, coronaravirus, ECNO viruses, Coxsackie viruses act as the cause of bronchitis [6,19]. In the pathogenesis of airway hyperreactivity, a decisive role is given to the development of inflammation, which can be caused by infectious, allergic, toxic, physical and neurohumoral influences. The cytokine system is the initiator of a cascade of reactions, in turn, leading to the release of new mediators and cell migration to the site of inflammation, transforming the "vicious circle", predisposing to a prolonged course of bronchial obstruction and superinfection [7]. The development of bronchospasm is accompanied by impaired microcirculation, increased vascular permeability, vascular plasma output, and increased production of IgE [20]. Developing pathological changes cause bronchial hypersensitivity and hyperreactivity [9,10,15]. When the epithelium of the bronchi is damaged, sensitive nerve endings become available, when stimulated, the release of neuropeptides - mediators of neochrome - and the non-adrenergic nervous system, which play an important role in the development of neurogenic inflammation in the bronchi, occurs. In this case, it is inflammation that is the main cause of the formation of bronchial hyperreactivity. Bronchial hyperreactivity develops regardless of the cause that caused inflammation of the bronchi [7,10].

Recent studies have identified the most significant factors contributing to the development of recurrent bronchitis in children: age-related features of the respiratory tract and chest; respiratory infection (respiratory syncytial viruses, influenza and parainfluenza viruses, adenovirus, mycoplasma); features of local immunity; social factors (passive smoking, parental alcoholism); environmental factors; aggravated obstetric, perinatal history, hereditary and allergic history, the presence of concomitant pathology

and other foci of chronic infection [4,5,10,16]. Anatomical and physiological features of the respiratory organs in young children play a significant predisposing role in the development of bronchial obstruction [5]. They are characterized by compliance of the cartilage of the bronchial tract, insufficient rigidity of the bone structure of the chest, which freely reacts by retraction of compliant places to an increase in resistance in the airways, as well as features of the position and structure of the diaphragm [5,14,18].

Early childhood is also characterized by imperfection of immunological mechanisms: the formation of interferons in the upper respiratory tract, serum immunoglobulin A (by the end of the first year of life, its level is 28% of the level of adults), secretory immunoglobulin A (maximum values are determined only by 10-11 years of age) are significantly reduced.), the functional activity of the T system of immunity is also reduced [16].

There are reports that children with an atopic phenotype of obstructive syndrome are genetically predisposed to the persistent course of some viral and atypical (RS viruses, adenoviruses, parainfluenza, bocaviruses) infections [4,6,16]. Genetic studies have shown that polymorphisms in the interleukin-8 (IL-8), interleukin-10 (IL-10), and toll-like receptor (TLR) genes are associated with the severity of RS viral infection. It is assumed that it is not the RS infection itself that leads to the development of the atopic phenotype of bronchial obstruction, but the previous exposure to unfavorable genetic and antenatal factors [4,9]. Many authors substantiate the leading role of the unfavorable environmental situation in the region of residence in the pathogenesis of airway hyperreactivity [6,9,10,11,13,17].

Maternal smoking has a direct negative effect on fetal lung development, as it leads to a decrease in IL-4, INF- γ and increases the proliferation of mononuclear cells in the umbilical cord blood to house dust [6,10,17]. The alcoholism of parents also has a certain influence. In children with alcoholic fetopathy, bronchial atony develops, mucociliary clearance is disturbed, and the development of

protective immunological reactions is inhibited [10,13].

Great importance in the development of RB is given to ante- and perinatal factors. In children born to mothers with preeclampsia, hypertension, diabetes, the risk of developing early transient, persistent obstruction is increased, the use of antibiotics during childbirth can cause both early transient and persistent obstruction [1,4].

Modern principles of treatment of recurrent bronchitis with broncho-obstructive syndrome in children.

Treatment of broncho-obstructive syndrome in children should be complex and individual in each case. In some cases, the disease is mild and does not require hospitalization. Replacement therapy, optimal rehydration, oxygen therapy form the basis for the treatment of children with acute recurrent bronchitis in need of inpatient treatment.

Oxygen therapy should form the basis of treatment. Oxygenation is optimal at a saturation level below 94%. In cases where the saturation falls below 90%, the oxygen supply should be $\geq 90\%$ [2].

Studies of the effectiveness of the use of nebulizer inhalations of ipratropium bromide, salbutamol and epinephrine hydrochloride in BOS showed a significant improvement in the clinical signs of the disease [8,13]. The combination drug ipratropium bromide + fenoterol (Berodual) is currently used most often in the complex therapy of biofeedback in children. It combines 2 mechanisms of action: stimulation of β_2 -adrenergic receptors and blockade of M-cholinergic receptors [8].

Antibiotic therapy in children with acute recurrent bronchitis is prescribed if a bacterial infection is suspected (hyperthermia, toxicosis, concomitant otitis, x-ray picture of infiltrative foci in the lungs, leukocytosis, positive bacterial culture), especially in children of the first 6 months of life. When prescribing antibiotics, the drugs of choice are ampicillin, cephalosporins [3].

In patients with severe and complicated course of the disease, the use of antiviral agents, including recombinant interferons

(viferon or laferabion), can be considered after consultation with relevant specialists [8,16].

Conclusion. Thus, the analysis of the literature indicates that the problem of broncho-obstructive syndrome is one of the most urgent in modern pulmonology. This is due to the high incidence of its recurrence, the indicators of which are currently among the leading causes of disability among the population. The high frequency, and at the same time little study of the recurrence of acute obstructive bronchitis in children, makes it necessary to study the risk factors for their development in more depth. In order to reduce morbidity and child mortality, the theoretical and practical significance of studying the influence of risk factors on the development of a recurrent course of acute obstructive bronchitis in children is obvious in order to develop optimally effective methods for their prevention.

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