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RECURRENT BRONCHITIS IN CHILDREN: DIAGNOSIS CRITERIA AND TREATMENT

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ABSTRACT

Recurrent bronchitis occupies one of the leading places among respiratory diseases in children and requires a careful approach from pediatricians, since it is a risk factor for the subsequent development of a number of chronic respiratory diseases. The occurrence of recurrent bronchitis is associated with an acute respiratory viral infection and occurs under the influence of unfavorable environmental factors: passive smoking, air pollution, poor living conditions; presence of a burdened perinatal history. Episodes of recurrent bronchitis in children are characterized by inflammatory changes in the bronchial mucosa, weakening of local protective factors, mild obstructive disorders, as well as cytomorphological changes in the cellular composition of induced sputum and degeneration of the ciliated epithelium). The use of combination drugs as a means of initial therapy has a positive effect on the clinical course of recurrent bronchitis in children and accelerates recovery, which is due to its normalizing effect on mucociliary clearance, nonspecific factors of local immune defense of the bronchial mucosa, as well as mucokinetic and indirect anti-inflammatory effects.

KEYWORDS

recurrent bronchitis, children, causes, diagnostic criteria, treatment.

Introduction

Recurrent bronchitis is a special nosological entity that requires a careful approach from pediatricians, since it is a risk factor for the subsequent development of a number of chronic respiratory diseases. The disease occupies one of the leading places among respiratory diseases, the frequency of which in the structure of bronchopulmonary diseases ranges from 5 to 40% [1-5].

The higher prevalence of recurrent bronchitis in environmentally unfavorable areas in preschool children and its decrease in primary school age is explained by adaptation processes [8-11]. As for the outcomes of recurrent bronchitis, they are not always clear: in many cases (70-80%), spontaneous recovery occurs, but in some children it can transform into bronchial asthma.

The occurrence of recurrent bronchitis is closely related to acute respiratory viral infection, when the provoking factor in the development of the first episode of recurrent bronchitis is ARVI (mainly

influenza virus or parainfluenza type 1, adeno- and RS-virus). With relapses of bronchitis, a bacterial infection (pneumococcus, Haemophilus influenzae) and mycoplasma may occur [18-23].

Recurrent bronchitis in children of early and preschool age, according to numerous studies, often occurs under the influence of unfavorable environmental factors: passive smoking, indoor and outdoor air pollution, poor living conditions; frequently ill relatives surrounded by the child; the presence of a burdened perinatal history (threatened miscarriage, previous stillbirths, intrauterine infection, etc.), hereditary predisposition to respiratory diseases [12-17].

Anatomical and physiological features of the respiratory system in children of the first three years of life (narrowness of the airways, looseness and hydrophilicity of the mucous membrane of the bronchial tree, its tendency to edema and hypersecretion against the background of the inflammatory process) is probably one of the main reasons for the appearance of symptoms of bronchitis [24,29]. The formation of insufficiency of the mucociliary and surfactant systems creates conditions for maintaining the inflammatory process, which, in turn, leads to a change in the amount and rheological properties of sputum, as well as to disruption of the drainage function of the bronchi.

It should be noted that it is the violation of mucociliary clearance that is the key mechanism contributing to the recurrence of bronchitis [9,10,16]. Clinical studies confirm that impaired mucociliary clearance in children with recurrent bronchitis is accompanied by changes in the viscosity and elasticity of bronchial secretions, increased secretory function of the bronchial glands and goblet cells, changes in the ratio of neutral and acidic glycoproteins of sputum and, as a consequence, this leads to the development of mucostasis, which further aggravates existing dysfunctions of the ciliated epithelium of the bronchi.

Currently, the following main criteria for diagnosing recurrent bronchitis are distinguished:

- repeated episodes of acute bronchitis 2–3 times or more during the year against the background of an acute respiratory infection;
-duration of the exacerbation period – 2 weeks or more,
-absence of external signs of bronchospasm, bronchial obstruction, respiratory failure;
- low-grade body temperature;
- clinical sign – cough, the duration of the cough is longer than the duration of wheezing in the lungs;
- percussion tone over the lungs is not changed, it may be shortened in the basal area;
- on auscultation, breathing may be harsh, with the presence of diffuse dry and variable wet rales;
-change in the pulmonary pattern in the absence of infiltrative and focal shadows in the lungs [6,7].

It has been established that in children with recurrent bronchitis, even during remission, there are disturbances in the cellular composition of induced sputum. In particular, they have such cytomorphological changes as an increase in the number of effector cells (neutrophils, lymphocytes, eosinophils) correlated with bacterial colonization of sputum, a decrease in the activity of macrophage reactions, and a significant increase in the number of dystrophically altered cells of the ciliated epithelium of the bronchi. In addition, in children with recurrent bronchitis, there is a violation of local immunity: a decrease in the levels of secretory immunoglobulin (Ig) A and lysozyme in saliva. All these pathological changes disrupt the protective properties of the bronchial tree, lead to a deterioration in the drainage function of the bronchi and ultimately contribute to the recurrence of the inflammatory process [4,12].

The problem of treating recurrent bronchitis is one of the most difficult in childhood pulmonology [15,17]. The most important factor determining the prognosis of the course of the disease is the rational choice of initial therapy at the primary stage of medical care. Since the main clinical symptom of recurrent bronchitis is a long-lasting cough, pediatricians need to be able to correctly assess its nature and adhere to modern recommendations for its treatment.

For proper treatment of cough, it is imperative to take into account the pharmacological characteristics of antitussives. Today, the pharmaceutical market offers a wide range of antitussives from various groups: drugs that stimulate expectoration, mucolytics, mucoregulators, mucohydrants, as well as combination drugs. It must be remembered that at the beginning of an acute inflammatory process in the bronchi, accompanied by a dry cough, drugs that stimulate sputum secretion are indicated; for an unproductive wet cough, drugs that dilute sputum are indicated; and for a productive cough, mucoregulators are indicated that normalize mucus formation and the composition of secretions.

In recent years, combination antitussive drugs, which include several active ingredients with different mechanisms of action that facilitate the removal of sputum from the bronchi, have become increasingly widely used in outpatient pediatric practice. The indisputable advantage of combined antitussive drugs is the combination of expectorant, mucolytic and anti-inflammatory properties; thanks to this, they provide a simultaneous effect on almost all the main links in the pathogenesis of cough [11,13].

Thus, episodes of recurrent bronchitis in children are characterized by inflammatory changes in the bronchial mucosa, weakening of local protection factors, mild obstructive disorders and latent bronchospasm, as well as cytomorphological changes in the cellular composition of induced sputum (primarily an increase in the number of main effector cells and dystrophy of the ciliated epithelium) [12,14]. The use of combination drugs as a means of initial therapy has a positive effect on the clinical course of recurrent bronchitis in children and accelerates recovery, which is due to its normalizing effect on mucociliary clearance, nonspecific factors of local immune defense of the bronchial mucosa, as well as mucokinetic and indirect anti-inflammatory effects.

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