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RISK FACTORS FOR THE DEVELOPMENT OF BRONCHIAL OBSTRUCTION SYNDROME IN CHILDREN WITH RECURRENT BRONCHITIS

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ABSTRACT

The aim of our study was to determine the risk factors for the formation of recurrent bronchial obstruction based on the obstetric and somatic history of mothers. The material for the study was children with recurrent bronchial obstruction (RBO) at the age of 1 to 15 years. The results of the study showed that children with a high frequency of ARVI are at risk for developing RBO. Anemia and ARVI in mothers during pregnancy, as well as asphyxia in childbirth, is a prognostic unfavorable factor for the development of recurrent bronchitis in children in the future. Prematurity, previous abortions, the presence of concomitant chronic ENT pathologies and allergic diseases are unfavorable factors for the development of a recurrent course of bronchial obstruction syndrome.

Key words: children, bronchial obstruction, bronchitis, risk factor

INTRODUCTION

To date, one of the most common respiratory diseases in childhood is bronchitis, which is often accompanied by relapses and a prolonged course. Preventing the formation of recurrent bronchial obstruction is an urgent problem and a difficult task for every pediatrician. In recent years, the increase in the incidence of acute obstructive bronchitis with a recurrent course is compounded by the fact that this category of children has a high frequency of repeated cases of bronchial obstruction syndrome (BOS) a few weeks after discharge from the hospital, which subsequently leads to the formation of continuously recurrent bronchial obstruction (RBO) or bronchial asthma (BA) [1,6].

According to numerous studies, in children of early and preschool age, unfavorable environmental factors provoke the development of recurrent bronchitis: environmental pollution and intravascular air, passive smoking, poor material and living conditions, visits to preschool institutions and places of mass gathering of people in closed rooms. In addition, the importance of perinatal

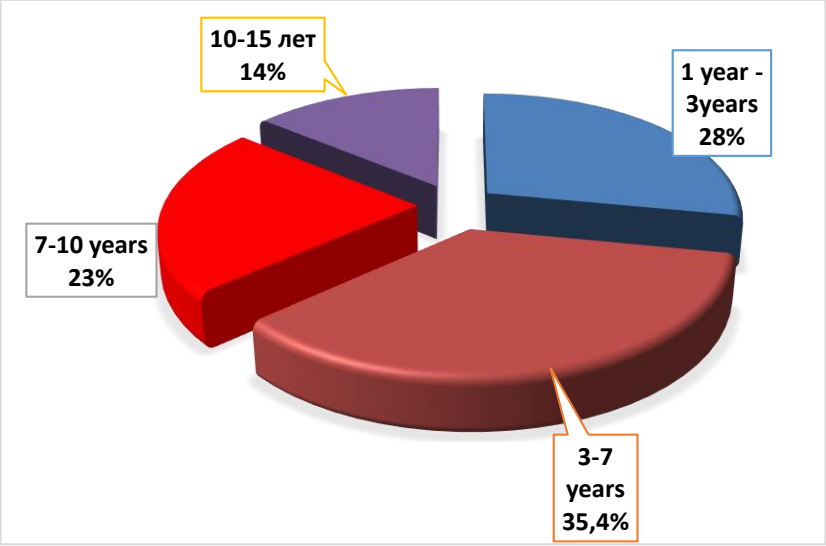
factors, such as the threat of termination of pregnancy, previous stillbirths, intrauterine infection, etc., is discussed. Recent studies have shown that respiratory viruses can provoke the development of transient bronchial hyperreactivity within 4-6 weeks from the onset of the disease due to the irritation of the nerve endings of the submucosal layer of the bronchi by causally significant microorganisms. According to the review of domestic and foreign literature, it is possible to distinguish several groups of factors that most often contribute to relapses of SBD against the background of respiratory infection. One of the factors is the presence of bronchial hyperreactivity, which developed as a result of an acute respiratory infection of the lower respiratory tract [2, 3,].

The aim of our study was to determine the risk factors for the formation of recurrent bronchial obstruction based on the obstetric and somatic history of mothers.

The material for the study was made up of 164 children diagnosed with recurrent bronchitis with bronchial obstruction syndrome (BOS) at the age of 1 to 15 years. In these patients, BOS had a recurrent character, which was observed 3 or more times during the year. The diagnosis was verified on the basis of clinical and anamnestic data and a standardized examination: laboratory and instrumental methods of research, including spirography with a provocative test, chest X-ray (according to indications), and a questionnaire using a specially designed questionnaire. The comparison group included 105 children with acute obstructive bronchitis (AOB) and 76 children with bronchial asthma (BA) and 50 children in the control group of the same age.

The results of the comparative study showed that among children with RBO, the largest percentage of children were patients aged 3 to 7 years (35.4%) (Figure 1).

Figure 1. Prevalence of RB in children, depending on age, %



The age restriction is based on the features of the respiratory and immune systems, which are largely associated with the processes of their development and maturation. At the age of 1-6 years, there is a reorientation of the immune response to infectious antigens, and there is a high sensitivity of young children to infections.

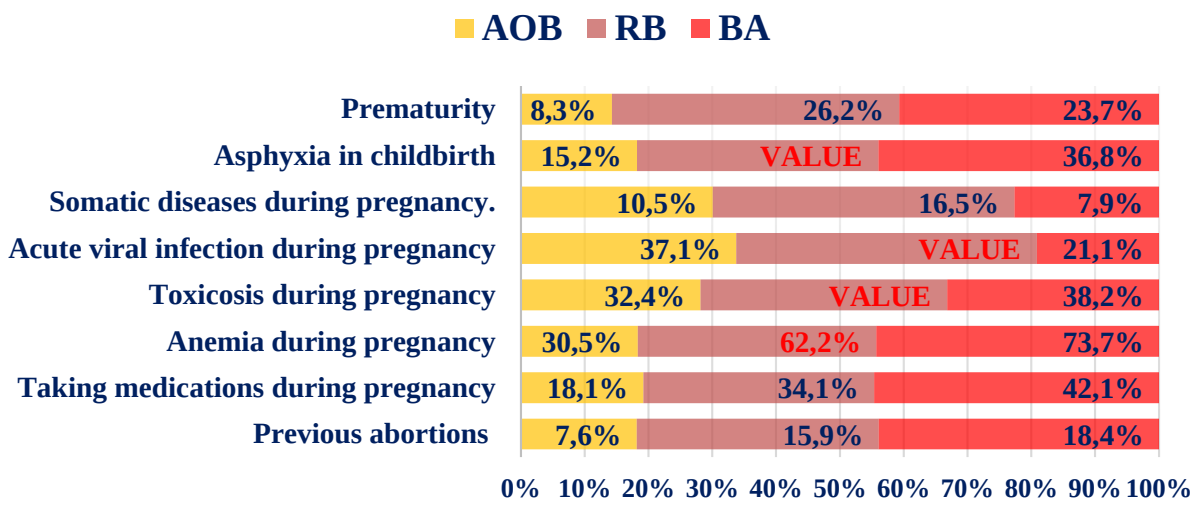
In addition, in children of the first years of life, the processes of differentiation of bronchopulmonary structures and the vulnerability of the respiratory tract are intensively occurring. The biocenosis of the upper respiratory tract in infants is also in the process of formation, and the microbial landscape is very unstable and polymorphic, it depends on the environment and changes with the age of the child [4,5].

To date, RB with BOS is often considered as BA, the debut of which in children often coincides with the development of intercurrent acute respiratory disease. Observations have shown that BOS in the most cases develops in children who are often ill. Many scientists and practitioners agree with this opinion. By frequently ill children, we meant the presence of episodes of upper respiratory tract respiratory infections more than 7-8 times a year during the first 3 years of life and 5-6 in preschool and primary school age [3,7]. A significant proportion of the patients we examined, namely 41(39.0%) from the group with AOB, 128(78.0%) from the group with recurrent bronchitis and 36(47.4%) from BA, suffered from frequent respiratory viral infections. The analysis of the research results showed that the highest percentage of SARS occurrence was observed in the group of children from 1 to 3 years (78.3%) and from 3 to 7 years (84.5%). Observations have shown that the onset of respiratory infections in the first year of life has an adverse effect on the formation of RB in the future. According to the data obtained, in the group of patients with RBO, cases of respiratory viral infections up to 3 years in the anamnesis were significantly more noted than in the group of children with AOB (78 % vs. 39%, $p<0.05$).The distribution of children with RB depending on their age and the number of ARVI patients during 1 year showed that the largest number belonged to the age of 3-7 years (84.5%), while the smallest number of cases was observed among patients from 7-10 years (39.1%).

Thus, children with a high frequency of ARVI are at risk for the development of recurrent BOS. This is due, on the one hand, to the fact that there is a development of transient hyperreactivity of the bronchi, which persists for 4-6 weeks from the onset of the disease, on the other – the spontaneous ability of the virus to affect mast cells with the subsequent production of histamine and other inflammatory mediators that affect smooth muscles, goblet cells and blood vessels with the implementation of the recurrent BOS clinic. It should be noted that after

recovery from ARVI, the patient may have signs of hyperreactivity of the bronchi for several weeks and there is a risk of recurrence of the respiratory process. The analysis of obstetric and somatic anamnesis of mothers of patients with RBO showed that mostly children were born from 2-3 pregnancies, while 62.2 % of women had the pregnancy period against the background of anemia, 44.5 % - toxicosis, previous abortions 8.5%; taking medications during pregnancy 34.1%. At the same time the largest number of children with RBO were born from full-term pregnancy, 26.2% of patients were premature, 14.3% of children were born in asphyxia (Figure 2.). Previous abortions in mothers of children with RBO were detected significantly 2 times more often than in the group of children with AOB. Among all the variety of pathologies during pregnancy in the group of children with RB, cases of acute respiratory viral infections in mothers were most often recorded (51.8%). The analysis of statistical data showed that anemia in mothers during pregnancy is a prognostic unfavorable factor for the further development of recurrent bronchitis in children and the formation of bronchial asthma.

Figure 2. Risk factors based on obstetric and somatic history of mothers in children with RB, %



The results of studies of the premorbid background in the examined groups of children showed that the course of RBO was significantly more frequent against the background of anemia-78.0%, chronic eating disorder in the form of grade 1-2 Protein energy deficiency was the same with the group of children with BA, diathesis and food allergy were more often observed in the group of children with BA (47.4% vs. 23.8%), food allergy – 60.5% vs. 28.0%. Chronic foci of ENT infection were significantly more frequent in the group of children with RBO (39.0%) compared to the control group (18.0%) ($p<0.05$). The presence of

concomitant allergic diseases is an unfavorable factor for the development of a recurrent course of bronchial obstruction syndrome (Table 1).

Table 1. Results of a comparative analysis of the premorbid background in the examined children. %

Premorbid background	RBO		AOB		BA		Control		P
	n	%	n	%	n	%	n	%	
Anemia	128	78,0	52	49,5	51	67,1	18	36,0*	t=4.88 p<0,001
Protein energy deficiency	43	26,2	14	13,3	16	21,1	6	12,0*	t=2.70 p=0.007
Paratrophy	31	18,9	8	7,6	17	22,4	5	10,0*	
Diatheses	39	23,8	18	17,1	36	47,4*	7	14,0	t=2.74 p=0.006
Psychomotor development delay	11	6,7	8	7,6	8	10,5	8	16,0	
Food allergy	46	28,0*	16	15,2	46	60,5**	4	8,0*	t=4.91 p<0,001
Chronic infections ENT organs	64	39,0	29	27,61	22	28,90	9	18,0*	t=3.17 p=0.0017

Note: p<0.001-p<0.05-statistically significant differences between the study groups

Most often, the cause of BEN and anemia in children with bronchitis were alimentary factors: early transfer to artificial feeding and mixed, quantitative under-feeding or qualitative under-feeding due to the poverty of the daily diet with proteins, vitamins, and trace elements. The influence of premorbid factors on the development of diseases occurring with BOS is recognized by most scientists and practitioners. The results of the study showed that children with a high frequency of ARVI are at risk for the development of recurrent BOS. Anemia and ARVI in mothers during pregnancy, as well as asphyxia in childbirth, is a prognostic unfavorable factor for the development of recurrent bronchitis in children in the future. Prematurity and prior abortions are also predictors of the development of bronchial obstruction syndrome in children with recurrent bronchitis. The presence of concomitant chronic infections of the ENT organs and allergic diseases are unfavorable factors for the development of a recurrent course of bronchial obstruction syndrome. The features of clinical and anamnestic data revealed by us in children with RB occurring with BOS allow us to form risk groups and develop prognostic criteria for the development of the disease long before the manifestation of the disease and to carry out early preventive measures. In this regard, it is necessary to continue a broad and comprehensive study of the pathogenetic mechanisms and genetic aspects of the predisposition of children to the development of recurrent bronchitis as a multifactorial pathology.

REFERENCES

1. Abaturov A. E., Rusakova E. A. Prediction of individual risk of bronchial obstruction in acute bronchitis in young children. // Child health. 2015.-№ 1(60). – P. 55-60.

2. Gaparkhoeva Z. M., Bashkina O. A., Seliverstova E. N. Comparative characteristics of the trigger mechanisms of BOS formation in children with BA and RB. // Kazan Medical Journal. 2016. Vol. 97. - No. 1. - p. 66.

3. Davidenko E. V. Prognostication of BA development in children who underwent OOB at an early age. // Scientific Bulletin of the Belgorod State University. Series: Medicine. Pharmacy. 2014. 4 (175). issue 25. - C. 89-93.

4. Zakirov I. I., Safina A. I., Shagiakhmetova D. S. Differential diagnosis of recurrent bronchitis in children. //Russian Bulletin of perinatol and pediatrician. 2016. -№ 5(61). -C. 141–148.

5. Ivanova, N. A. Bronchial obstruction in children: a differentiated approach in the diagnosis and management of patients / Ivanova, N. A. / / Pediatrics: adj. to the journal. Consilium medicum. - 2015. - No. 3. - pp. 57-60.

6. Lebedeva V. A. The relevance of the problem of respiratory pathology in children. // Bulletin of the Kazakh National Medical University. 2013.-№3(2). - C. 143-144.

7. Nuriakhmetova A. Zh. Fayzullina R. M. Clinical and anamnestic features in children with recurrent and chronic respiratory diseases living in the industrial region. // Medical Bulletin of Bashkortostan. 2013. Volume 8, - No. 3. - C. 67-68.