Risk Factors of the Development of Bronch obstructive Syndrome in Children with Acute Bronchitis

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ABSTRACT

Community-acquired pneumonia and acute obstructive bronchitis occupy the largest proportion among respiratory diseases in children undergoing inpatient treatment. Currently, there is an increase in the number of obstructive bronchitis, which is 4.5-7.5 thousand cases per 100 thousand children. It is believed that this disease is the leader in the number of requests for outpatient medical care, while in 25-30% of young children respiratory infections occur with a clinic of obstructive bronchitis of varying severity, and in 30-50% of these cases the disease can take a protracted, undulating or recurrent course. In the course of a comparative analysis of the dynamics of clinical symptoms of acute obstructive bronchitis in patients of groups I and II, several significant distinguishing symptoms were identified in the group of children with bronchial obstructive syndrome. These features can help in earlier diagnosis and determination of the characteristics of the treatment of the disease in this group of patients.

Keyword risk factors, broncho-obstructive syndrome, acute bronchitis, children

Introduction. Diseases of the bronchopulmonary system remain the most common in childhood, and despite the growing number of studies devoted to this problem, it is necessary to continue a detailed approach to the issues of pathogenesis, the state of the immune system in pathology [1, 2]. Acute obstructive bronchitis remains one of the most common and severe diseases of the respiratory system in children [3,4,6]. It is reported that in our region the incidence of AOB in children has a clear dependence on the season of the year, region, age of the child and the epidemiological situation. [5,7].

It has been noted that wheezing and shortness of breath against the background of respiratory diseases at least once in a lifetime have at least 50% of children, while recurrent bronchial obstruction is typical for 30-50% of children [8,10]. According to the existing classification of bronchopulmonary diseases, acute bronchitis in children is divided into acute (simple) bronchitis and acute obstructive bronchitis according to the course options [9]

Acute bronchitis is an inflammatory disease of the bronchial mucosa, the causes of which are often infectious, non-infectious, less often chemical and physical factors. To date, convincing data have been accumulated on the important role of the immune system in the formation and development of AOD in children. Thus, despite the growing number of publications on the problem of acute obstructive bronchitis, which is common in childhood, it is necessary to continue further study of risk factors for the development of this disease.

Purpose of The Study: to establish anamnestic risk factors for the development of broncho-obstructive syndrome in children with acute bronchitis.

Material and Methods: In order to establish significant risk factors for the formation of AOB in frequently ill children, a comprehensive analysis of external and internal factors affecting the child's body and influencing the

development of the disease was carried out and, using statistical methods, the diagnostic significance of each factor in the groups of patients studied was evaluated. 2 groups of children were examined, 40 patients in each group, group I included 40 patients with acute bronchitis complicated by biofeedback, group II included 40 patients with acute bronchitis not complicated by biofeedback.

Results. To determine the significance of the frequency of occurrence of anamnestic data in patients characterizing the features of the course of AOB in children, an analysis of arbitrary contingency tables was carried out (Table 1).

Table 1. Comparative analysis of the frequency of anamnestic data in acute bronchitis in children

Figure	detection rate (%)		OR	χ2	P	CI min	CI max
	II group	I group					
Gestational age							
31-37 weeks	11,3	10,0	1,14	0,04	0,835	0,33	3,96
38-41 weeks	78,8	72,5	1,41	0,58	0,445	0,58	3,38
>42 weeks	10,0	17,5	0,52	1,37	0,242	0,18	1,57
Age							
up to 1-3 years	58,8	62,5	0,85	0,16	0,693	0,39	1,86
4-5 years	28,8	30,0	0,94	0,02	0,887	0,41	2,16
>6 years	12,5	7,5	1,76	0,69	0,41	0,46	6,80
Gender							
male	57,5	55,0	1,11	0,07	0,794	0,52	2,38
female	42,5	45,0	0,90	0,07	0,794	0,42	1,94
Type of feeding during 1st year of life							
breastfeeding	10,0	30,0	0,26	7,68	0,006	0,10	0,70
mixed feeding	13,8	25,0	0,48	2,34	0,126	0,18	1,25
bottle-feeding	76,3	45,0	3,92	11,58	0,001	1,75	8,80
Recurrence rate of respiratory infections per year							
4 times	13,8	40,0	0,24	10,54	0,001	0,10	0,59
5 times	38,8	37,5	1,05	0,02	0,894	0,48	2,31
over 6 times	47,5	22,5	3,12	7,00	0,008	1,32	7,38
Age of manifestation of the first episode of broncho-obstructive syndrome							
up to 1 year	72,5	35,0	4,90	15,63	0,000	2,17	11,05
from 1 to 3 years	21,3	47,5	0,30	8,75	0,003	0,13	0,68
3 years and older	6,3	17,5	0,31	3,75	0,053	0,09	1,06
The frequency of clinical symptoms of broncho-obstructive syndrome per year							
up to 1 time	7,5	20,0	0,32	4,04	0,044	0,10	1,01
2 times	10,0	30,0	0,26	7,68	0,006	0,10	0,70
3 time	30,0	30,0	1,00	0,00	1,000	0,44	2,29
over 4 times	52,5	20,0	4,42	11,59	0,001	1,81	10,77
Allergic anamnesis							
food allergy	28,8	32,5	0,84	0,18	0,673	0,37	1,90
drug reaction	11,3	10,0	1,14	0,04	0,835	0,33	3,96

allergic reactions as acute urticaria and angioedema	3,8	5,0	0,74	0,10	0,747	0,12	4,62
Social conditions							
kindergarten attendance	72,5	30,0	6,15	19,82	0,000	2,67	14,19

Note: indicators OR, χ2, P - significance of differences, CI min and CI max between groups.

A comparative analysis of the studied parameters in patients with OB presented that, in terms of gestational age, the birth rate of patients from the group with BOS practically did not differ from children of group II (OR = from 0.52 to 1.41; CI = from 0.18 to 3.96; χ2 = from 0.04 to 1.37; p = from 0.242 to 0.835)

In patients in group II, the main proportion of the incidence of children with was observed under the age of 1 year (58.8%), compared with patients with typical etiology (62.5%), while there was no significant significance of this age range (OR=0.85; CI=0.39-1.86; χ2= 0.16; p=0.693), as well as other age groups (OR= from 0.94 to 1.76; CI = 0.41 to 6.80; χ2 = 0.02 to 0.69; p = 0.41 to 0.887).

There was no gender difference in the groups, both boys and girls suffered equally (OR= 1.11 to 0.90; CI= 0.42 to 2.38; χ2= 0.07; p=0.794).

Since nutrition in the first year of life plays a significant role in the formation of diseases in children, we analyzed the nature of feeding in children of both groups in the first year of life. According to the presented data, the calculated indicators confirm the diagnostic value of artificial feeding in formation - 76.3% of cases in group II and 45.0% in group I (OR=3.92; CI=1.75-8.80; χ2=11.58; p=0.001). Early artificial feeding increases the risk of various diseases, including acute respiratory viral infections in infants, including the influence of nutrition on the formation of immunological reactivity in a growing child's body. On the contrary, natural feeding, timely introduction of complementary foods serves as a protective factor in relation to the development of AOB in II, in which the frequency in group II in relation to group I was 10.0% and 30.0%, and mixed 13.8% and 25.0%, respectively, having no diagnostic value (OR=0.26 and 0.48; CI=0.10-0.70 and 0.18-1.25; χ2= 7.68 and 2.34; p=0.006 and 0.126).

Conclusion. Thus, in the course of a comparative analysis of the dynamics of clinical symptoms of acute obstructive bronchitis in patients of groups I and II, several significant distinguishing symptoms were identified in the group of children with bronchial obstructive syndrome. These features can help in earlier diagnosis and determination of the characteristics of the treatment of the disease in this group of patients.

Understanding the pathogenetic role of the identified risk factors can contribute to a deeper understanding of the mechanisms of the development of the disease in acute obstructive bronchitis and have the development of more effective strategies for diagnosing and treating the disease.

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