

RISK FACTORS FOR THE DEVELOPMENT OF SEVERE BRONCHIAL ASTHMA

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Abstract. The aim of our study was to evaluate the clinical manifestations and risk factors for the development of bronchial asthma (BA) in children. We examined 80 children aged 1 to 16 years with BA who were hospitalized in the pulmonology department of the Andijan Regional Medical and Clinical Center. In moderate to severe asthma, a longer duration of shortness of breath, oral wheezing, wet cough, and wet rales in the lungs was observed. In the presence of severe bronchospasm, symptoms of intoxication, night attacks, fatigue, respiratory failure, and deterioration of spirographic parameters were more pronounced, which manifested themselves in long-term clinical signs of the disease. Among the main risk factors for the development of bronchial asthma, one can highlight hereditary burden, the degree of increase in the level of immunoglobulin E in the blood, the characteristics of the mother's nutrition during pregnancy and lactation, early transfer of the child to mixed and artificial feeding, unfavorable course of the peri- and intranatal periods and comorbid background.

Key words: bronchial asthma, risk factors, asthma attack, immunoglobulin E

Relevance. Bronchial asthma (BA) is one of the most common chronic non-infectious respiratory diseases in children.[1] Asthma is a disease in the development of which genetic factors and the impact of environmental factors are combined, forming phenotypic characteristics depending on age, timing of onset, and the type of inflammation in the bronchi.[2] The prevalence of goiter and the factors contributing to the development of the disease depend on climatic and geographical features, social factors [3,4] and the economic development of the country. Based on this, it is relevant to study the causal factors that contribute to the development of asthma, taking into account regional characteristics, since their underestimation leads not only to the formation of this pathology, but also to a worsening of the course and a worsening of the prognosis.

According to epidemiological studies, the prevalence of asthma among children averages 5-10% (6-8% in the United States). In Uzbekistan, asthma is recognized as the most common chronic lung disease in children, accounting for 5%. In 2015, asthma-related mortality worldwide amounted to 0.4 million people; over 25 years, mortality has decreased by 26.7%, but incidence has increased. 70% of children with asthma have a mild course of the disease, about 25% have a moderate course, and 5% have a severe course. Most patients are diagnosed 2–6 years after the onset of the disease, which worsens its course.[6] Reducing or eliminating causative factors can improve the primary prevention of asthma in children and adolescents; in addition, knowledge of the factors that aggravate the course of asthma will allow, to some extent, to improve disease control.

The aim of the study was to examine risk factors for the development of bronchial asthma in children.

Materials and methods. We examined 80 children aged 1 to 16 years with bronchial asthma who were undergoing inpatient treatment in the pulmonology department of the Andijan Regional Children's and Medical Center. Of these, 16.25% (13) of patients were diagnosed with intermittent BA, 13.75% (11) with mild persistent BA, 57.5% (46) of children with moderate persistent BA, and 12.5% (10) of children with severe persistent BA. The control group consisted of 20 children of the same age with obstructive bronchitis.

Results and discussion. The severity and outcome of BA are significantly influenced by the timeliness of hospitalization and medical care. It should be noted that patients were admitted for treatment and examination at different times after disease onset. Analyzing these indicators, we found that patients were mainly admitted on the 3-5 day of illness 62 (51.6%) after unsuccessful treatment at home.

It is known that important factors determining the health of a child and its development are the characteristics of the obstetric history, the condition of the child at birth and its development before the onset of the current disease. By analyzing the complete information on the medical history of the examined children, we identified the risk factors that were most common among them (Table 1). As can be seen from the table, the majority of patients with BA (59 (49.2%)) were born from their first pregnancy, 45 (37.5%) from their second or third pregnancy, and 14 (11.6%) from their fourth or later pregnancy. Among the observed mothers of the examined patients with BA, 104 (86.6%) had various pregnancy complications. Ninety-six (80.0%) mothers reported acute respiratory infections during pregnancy. A total of 104 (86.6%) mothers of the examined patients with bronchial asthma had various pregnancy complications. Ninety-six (80.0%) mothers reported acute respiratory infections during pregnancy. Mild or moderate anemia was diagnosed during pregnancy in 99 (82.5%) mothers of patients with bronchial asthma. Prematurity and birth asphyxia occurred in 9 (7.2%) and 26 (21.6%) cases, respectively. We have recorded perinatal and intranatal pathological symptoms in children as risk factors influencing the development of bronchial asthma. As follows from the table, factor analysis showed that the highest risk of developing bronchial asthma is possible in the presence of complications during pregnancy (RR=1.05; OR=5.08), illnesses suffered during pregnancy (RR=1.6; OR=4.2) and artificial feeding of the child (RR=1.7; OR=2.6).

Table 1.

Factor analysis of the risk of developing BA in the examined children

Risk factors	Practically healthy n=20		BA n=120		P	OR	RR
	abc	%	abc	%			
Born from: 1st pregnancy	8	40,0	58	49,1	>0,05	0,91	0,95
II -III pregnancy	9	45,0	45	37,5	>0,05	0,55	0,8
IV and more pregnant.	3	15,0	14	11,6	>0,05	0,7	0,86
Complications of the current pregnancy: toxicosis of the first and second half	9	45,0	104	86,6	>0,05	5,08	1,05
Anemia I-II degree	17	85,0	100	83,3	>0,05	0,87	0,98



Maternal illnesses during pregnancy: ARI	8	40,0	96	80,0	>0,05	4,28	1,66
Pathological course of labor	6	30,0	48	40,0	<0,01	1,69	1,41
Born: premature	3	15,0	8	6,6	<0,01	0,34	0,72
in asphyxia	6	30,0	6	21,6	<0,01	0,64	0,72
Nutrition up to one year:	13	65,0	56	6,6	<0,01	0,55	0,78
- natural							
- artificial	2	10,0	28	23,3	>0,05	2,64	1,71
- mixed	5	25,0	42	35,0	>0,05	1,8	1,52

Genetic predisposition plays a significant role in the development of asthma. Therefore, we conducted a detailed medical history study of 120 families in our study groups. The identified forms of allergic diseases are summarized in Table 2. A family history of allergies was twice as common in children with asthma. Allergic diseases were observed in 78.3% (94) of mothers and 38.3% (96) of fathers. In general, it was possible to identify a hereditary burden of allergic diseases in the observed children, more often on the maternal side, which amounted to 45.0% (54), than on the paternal side 40.0% (48). Some children had a bilateral hereditary burden of allergic diseases (31.6% (38)). Also, the fact of parental smoking in the presence of the child was revealed in 63.0% (75).

Table 2.

The role of hereditary burden of allergic diseases in the examined children

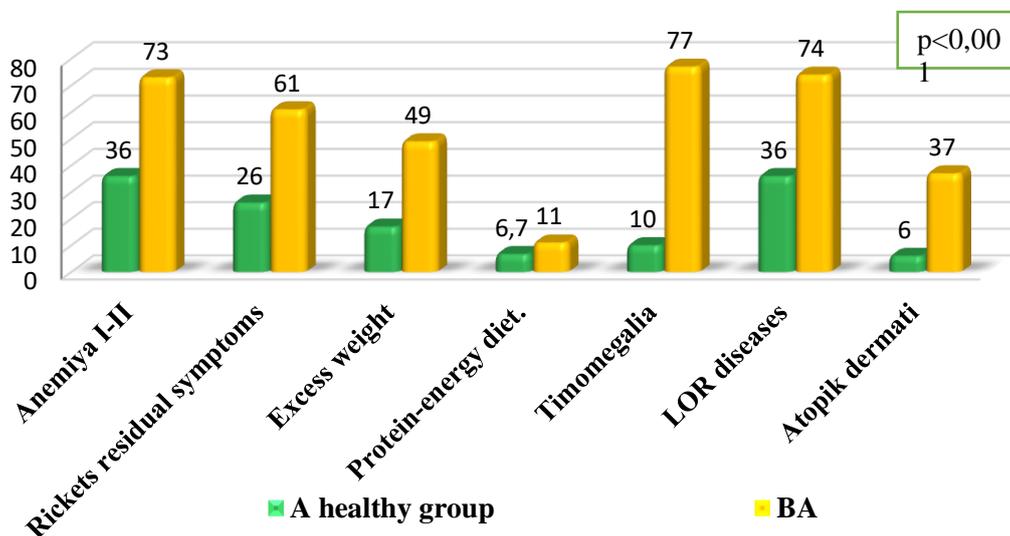
Analyzed indicators	Practically healthy n=20		BA n= 120		P	OR	RR
	abc.	%	abc.	%			
Allergic burden in the mother; maternal illness	7	35,0	94	78,3	>0,01	2,93	1,63
The father has a history of allergies	3	15,0	46	38,3	>0,01	3,65	2,38
Bilateral burden	2	10,0	38	31,6	>0,01	1,22	2,33
Along the line of matter	5	25,0	54	45,0	>0,01	2,65	1,03
On my father's side	4	20,0	48	40,0	>0,01	1,78	1,25
Parents smoking	7	35,0	75	62,5	>0,01	2,02	1,47



Factor analysis of hereditary burden showed that the highest risk of developing BA occurs in the presence of allergic diseases in parents (RR=2.3; OR=3.6) and parental smoking (RR=1.4; OR=2.05).

The severity of the disease in the examined patients is significantly influenced by an unfavorable premorbid background and comorbidities. Thus, in children with bronchial asthma, the following were detected: grade I-II anemia in 72.5% (87), residual effects of rickets in 45.8% (55), and atopic dermatitis in 70.0% (84). Of the concomitant pathologies, ENT diseases were found in 83.3% (100) of patients with bronchial asthma. In patients with bronchial asthma, 54 (83.1%) of the examined patients had ENT diseases, 30.0% (25) had BEN, and 12.5% (15) were overweight.

Factor analysis of the background condition and concomitant pathology showed that the highest risk of developing bronchial asthma is possible in the presence of residual effects of rickets (RR=1.8; OR=2.6), atopic dermatitis (RR=2.04; OR=8.6), and LOR diseases (RR=1.5; OR=2.9) (Diag.1)



Picture 1: Factorial analysis of the underlying condition and associated pathology and the observed details

Predstavlennye dnye eshche raz podverjdayut, chto deti s rizlichnoy stapenyu vyrajennosti background condition and accompanying pathology yavlyayutsya gruppyo riska po razvitiyu BA.

The main complaints of parents of all sick children upon hospitalization were cough with predominantly mucous sputum, often upon awakening and shortness of breath, loss of appetite in 90.0% (108), lethargy in 93.3% (112), asthma attacks in 80.0% (96), oral wheezing in 80.0% (96), sweating in 50.0% (60) and headache in 45.0% (54) of patients.

The leading clinical manifestation of bronchial asthma in all 120 patients (100%) was expiratory dyspnea involving accessory muscles, with a respiratory rate above 45 breaths per minute in those under 8 years of age and above 48 breaths per minute in those over 10 years of age. The duration of dyspnea was 4.2±0.2 days. Signs of hypoxia (cyanosis of the nasolabial triangle) were recorded in 49.1% (59) of patients, lasting 5.5±0.3 days. Oral wheezing was observed in all children with bronchial asthma (100%), lasting 5.2±0.2 days. Percussion

changes in the lungs were noted in 51 patients, accounting for 43.1%. Harsh breathing was auscultated in 70 patients with BA, or 58.3%; moist rales of varying caliber were heard, lasting 6-7 days. In 50 patients, dry wheezing was heard (41.7%), the duration of which was 6.5 ± 0.3 days. According to X-ray examinations of the respiratory organs, the majority of patients admitted in the first days of the disease were found to have emphysematous expansion of the lungs on both sides with horizontal ribs in 60%, and a pronounced vascular pattern in 49.2%. All patients showed increased infiltrative changes in the roots of the lungs with signs of destruction of their X-ray morphological structure.

Conclusions. Based on the obtained results, it can be concluded that moderate and severe asthma is characterized by a longer duration of shortness of breath, oral wheezing, wet cough, and pulmonary rales, as well as emphysematous enlargement of the lungs on both sides with horizontal ribs. In the presence of severe bronchospasm, symptoms of intoxication and respiratory failure were more pronounced, which manifested themselves in long-term clinical signs of the disease. The main risk factors for the development of bronchial asthma include a hereditary burden, maternal nutritional characteristics during pregnancy and lactation, early transfer of the child to mixed and artificial feeding, an unfavorable course of the peri- and intranatal periods, and a comorbid background.

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