

CLINICAL AND ANAMNESTIC FEATURES OF THE COURSE OF ACUTE BRONCHITIS IN CHILDREN

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Abstract. The purpose of the study was to detect clinical and anamnestic features of the course of acute obstructive bronchitis in children with a background of undifferentiated connective tissue dysplasia. Dynamic examination of 42 children with acute obstructive bronchitis was performed. The registration card for all children was developed and filled, it consisted of several sections: general information, family history, allergic history, life and past medical history, phenotypic assessment of undifferentiated connective tissue dysplasia. The results indicate that compromised allergic and genealogical history, as well as burdened obstetric history of the mother (threatened preterm delivery and gestosis) is significant risk factors.

Assessment of clinical manifestations of acute obstructive bronchitis in children showed that the severity of the disease, which is determined by the degree of severity and duration of symptoms, was associated with the number of signs of UCTD.

Keywords: acute obstructive bronchitis, children, undifferentiated connective tissue dysplasia, wheezing, phenotypic assessment.

Introduction. Acute obstructive bronchitis (AOB) in young children persists in contemporary pediatrics, despite the scientific and practical achievements in the field of etiopathogenesis of the disease and introduction of current therapies into the medical practice [1, 2, 3, 18].

The prevalence of AOB according to the authors listed ranges from 15 to 50 % [1, 2] and incidents of acute obstructive bronchitis in infants reaches 90 % [5, 6]. AOB is mostly manifested in infants in their first year of life and depends on morphofunctional features of the respiratory system at this age: narrowness of the respiratory tract, weak cartilages of the bronchial tree, and insufficient development of smooth muscle of the bronchial tubes which is one of the proofs of the theory of relative immaturity of all organs and systems in early childhood [7, 4, 17].

A special place in the formation of increased bronchoreactivity in infants and development of AOB is occupied by neuroreflexory mechanisms which are based on dysfunction of autonomic nervous system stipulated by bronchospasms,

vasodilation, hyperproduction of high secretion and triggering the development of AOB [3, 5, 19].

Results of many studies have been published recently. The authors consider bronchial dysfunction as a manifestation of autonomic dysfunction due to the disorder of the cartilage and connective tissue of the trachea and the bronchial tubes secondary to undifferentiated connective tissue dysplasia (UCTD) resulting in tracheobronchial dyskinesia [6, 9, 10, 12], and disorder of both drainage and ventilation functions of bronchial tubes.

Changes in connective tissue related to the disorder of synthesis and function of derivatives of collagen and elastic proteins are called connective tissue dysplasia. The definition was offered by P. Æighton (1983) [5]. It is a polygenic multifactorial state, manifested by external and internal phenotypic features and clinically significant dysplastic-dependent disorders of organs and systems with progressive presentation.

The pathological state of connective tissue leads to the disorder of its functions, which is important for the development of many diseases because of the disorder of the functions of other tissues, for instance, dystrophy (protein, fat) and immune reactivity decreasing with the further development of allergic autoimmune reactions.

A change in almost all of the functions of the connective tissue secondary to a decrease in

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adaptive capacity of the organism leads to the development of different clinical variants in manifestation of connective tissue insufficiency.

Vegetative dysfunction is an important component of UCTD in children with obstructive bronchitis (OB). It is manifested by eructation, colics, low weight gain, and respiratory disorders with respiratory failure in young children secondary to UCTD. In these cases arrhythmic breathing is associated with gastroesophageal reflux (manifestation of UCTD). When brought together, these factors are important in the formation of relapses of acute obstructive bronchitis: disorder evacuation of the bronchial secretion, hyperkinesia, and the consequences of gastric reflux.

Mucostasis and disturbance of the drainage function of the bronchial tubes in OB provide favorable conditions for permanent colonization of the bronchial tree by microorganisms.

Relapses of acute obstructive bronchitis in young children, their anatomical and physiological features, and growing allergization of the modern society create a pathophysiological complex that promotes further development of bronchial asthma in children.

2. Purposes, subjects and methods:

2.1. Purpose – is to detect clinical and anamnestic features of the course of acute obstructive bronchitis in children secondary to undifferentiated connective tissue dysplasia.

2.2. Subjects & Methods. The study was a one-stage cohort, and the sampling method was continuous (during hospitalization). The key population was children admitted for examination and treatment at the Department of Pulmonology. Inclusion criteria were as follows: age 5 years and younger, obstructive bronchitis in history (one or more), and parental consent to participate in the study. Exclusion criteria were diagnosed bronchial asthma, chronic somatic diseases at the stage of exacerbation, malformations of internal organs, congenital and hereditary diseases of the bronchopulmonary system and gastroesophageal reflux.

As a part of a study only one program of clinical and laboratory examination has been used to evaluate the criteria for the selected parameters.

The registration card for all children was developed and filled, it consisted of several sections: general information, family history, allergic history, life and past medical history, phenotypic assessment of UCTD (according to T.I. Kadurina, L.N. Abakumova, 2008), and the results of examination at the specialized

department [1, 7, 15, 20].

Statistical analysis of data was carried out using statistical software STATISTICA 10.0. Non-parametric Mann-Whitney U-test was used to assess the differences between the two groups in quantitative terms. The estimation of inter-group differences by qualitative features was carried out using the criterion χ^2 and Fisher's exact criterion.

Conflict of interests. There is no conflict of interests.

3. Results and discussion. According to the inclusion/exclusion criteria, 42 children with OB were included in the study and the average age of children was 3.2 ± 1.3 years. The children were divided into the following groups: main Group 1 ($n = 30$) comprised children with acute obstructive bronchitis and phenotypic manifestations of undifferentiated connective tissue dysplasia, and control Group 2 ($n=12$) included children with acute obstructive bronchitis without phenotypic manifestations of UCTD. The observation was conducted in the acute phase of the disease throughout the whole course of hospital treatment. The diagnosis of bronchitis was based on generally accepted clinical criteria, for the comparative description of the diseases, depending on the presence of UCTD the severity of clinical manifestations was evaluated in points. Diagnosis of UCTD implied assessment of stigmatization levels (a conditional indicator including the total number of UCTD points with the extraction of low (up to 12 points), middle (13–24 points) and high (more than 24 points) levels (using the table "Value of indices in the assessment of the degree of connective tissue dysplasia severity" by T.I. Kadurina, L.N. Abakumova, 2008). Group 1 children comprised 11 girls (36.7 %) and 19 boys (63.3 %), and Group 2 included 3 boys (25 %) and 9 girls (75 %) (Fig. 1).

The findings showed ($p < 0.05$) that boys predominated among the examined children with AOB and UCTD.

According to the questionnaire, the compromised allergic history was significantly more frequent ($p < 0.05$) in main group children (22 children from Group 1 (73.4 %), and 4 children from Group 2 (33.3 %).

The genealogical history of probands included information about the health of relatives in three generations, with a significantly higher frequency ($p < 0.05$) of burdened family history of chronic bronchopulmonary diseases (bronchial asthma, chronic obstructive pulmonary diseases) in three



Fig. 1. Distribution of children in the groups under investigation by gender

generations of Group 1 children (16 children (53.4 %)) and only 2 children from Group 2 (16.7%) (Fig. 2).

External phenotypic manifestations of UCTD in patients of the main group were more common ($p < 0.05$) than in children of the other group,

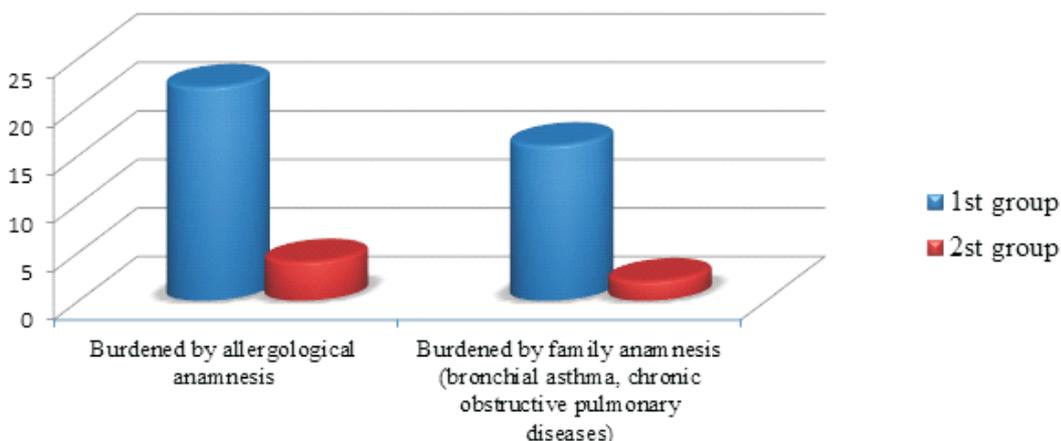


Fig.2. Distribution of children in the groups under investigation by burdened allergic and genealogical history

Among the mothers of the main group 19 mothers (63.3 %) had a risk of preterm delivery, which was significantly higher ($p < 0.05$) than in mothers of the other group (3 mothers, 25 %).

namely asthenic build, thin skin, soft and brittle nails, diastase of the abdominal muscles, fine and brittle hair and blue sclera (Table).

Also, the mothers of the control group had more manifestations of gestosis (70 %), among the other group only 4 women (30 %) had manifestations of gestosis (Fig. 3).

Examination of Group 1 children showed moderate degree of UCTD in 25 children (83.3 %), expressed as CTD in 5 (16.7 %) patients.

Assessment of clinical manifestations of AOB in children showed that the severity of the disease,

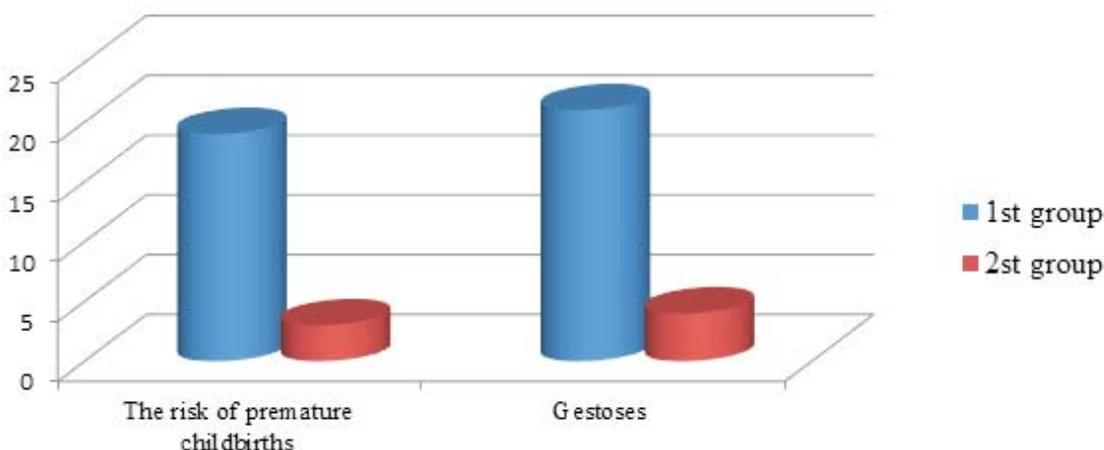


Fig. 3. Distribution of mothers of children in the groups under investigation according to burdened obstetric history (the risk of preterm delivery and gestosis)

Incidence of phenotypic signs of UCTD in patients of the groups under investigation

Phenotypic signs of UCTD	Group 1 (n=30)		Group 2 (n=12)	
	%	absolute	%	absolute
Asthenic body composition	53.3*	16	16.7	2
Dolichostomenoeia	16.7	5	8.35	1
Arachnodactyly	3.3	1	-	-
Hypermobility of the joints: moderate degree	50.0*	15	8.35	1
Velvet, soft skin	26.6	8	33.4	4
Thin skin (moderate venous mesh)	60.0*	18	16.7	2
Hyperelasticity of the skin:				
• low;	40.1	9	33.4	4
• moderate.	9.9	3	-	-
Nails (soft / brittle / flaky)	53.3*	16	16.7	2
Ears (soft / folded in a tube)*	53.3*	16	16.7	2
Blue sclera	53.3*	16	8.35	1
Petechia / ecchymosis / nosebleeds	20.0	6	16.7	2
Myatonic syndrome / diastasis of the direct abdominal muscles	23.3	7	8.35	1
Hernias/prolapse of organs / postoperative hernias	9.9	3	16.7	2
Hair (thin / brittle / areas of alopecia)	63.3*	19	25.0	3
1 st degree scoliosis	13.6	3	16.7	2
Flat-foot transverse / longitudinal	13.6	3	8.35	1
Pes valgus. Valgus deformation of the lower extremities.	9.1	2	8.35	1

Note. *p <0.05 when compared to Group 2 patients.

determined by the degree of severity and duration of symptoms, was associated with the number of UCTD signs. Thus, febrile fever in children of the main group was registered 3.5 times more often than in the other group (in 86.7 and 25.0 % of cases, respectively); p <0.05, while the terms of normalization of body temperature in 40.0 % of patients with UCTD were more than 5 days. Characteristics of cough in children of both groups did not have significant differences except in the long term perseverance of this symptom in patients with UCTD. Auscultatory changes were characterized by dry whistling and scattered damp melliferous wheezing secondary to prolonged exhalation. In children of the comparison group, the clinical symptoms of GBS lasted for 3.4 ±

1.2 days, while in Group 1 children clinical symptoms (dry whistling wheezing and prolonged exhalation) persisted for 5.2 ± 1.8 days.

Conclusions. Connective tissue dysplasia has a modifying effect on the course of acute bronchitis, resulting in greater severity and prolongation of the leading symptoms and syndromes, and the significant risk factors is the presence of a compromised allergic and genealogical history, as well as burdened obstetric history of the mother (threatened preterm delivery and gestosis). This emphasizes the need for the improvement of the program of examination of children with acute obstructive bronchitis for the prognosis of the course and optimization of treatment and rehabilitation measures.

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