

**BRONCHOSCOPIC FINDINGS IN CHILDREN WITH
OBSTRUCTIVE AND CHRONIC BRONCHITIS****Ukrainian Medical Stomatological Academy (Poltava)****doktor64@mail.ru**

The work was executed in the context of scientific research of the Research Institute of Pediatrics, Obstetrics, and Gynecology of Ukraine «Develop a system of diagnostic, therapeutic and preventive measures for newborns from mothers with genital infection» (state registration №0110U 002060).

Introduction. In the structure of diseases in young children a leading place is occupied by respiratory diseases, among which the most common are bronchitis [5,7,1,15]. The clinic of bronchitis has a number of similar features, despite the fact that these diseases may be related to different forms in classification. The chronic bronchitis problem complexity found to some extent is reflected in the International Statistical Classification of Diseases and Related Health (a review of WHO, 1995) [7], where different names (variants) of chronic bronchitis that are clinically difficult to distinguish, cause some difficulties in everyday practice appear: the simple chronic bronchitis (J41.0), mucopurulent (J41.1), mixed simple and mucopurulent (J41.8); unadjusted chronic bronchitis (J42), chronic obstructive bronchitis and asthma (J44). This complicates the diagnosis, modern treatment and prevention of this disease. Chronic bronchitis is characterized by a common lesion of the bronchi, accompanied by productive cough, persistent crackles in the lungs, the presence of 2-3 exacerbations per year for at least 2 years. Until recently it was believed that children have chronic bronchitis often secondary and it is a complication of congenital malformations of the lungs and the cardiovascular system. But now a prerequisite for the diagnosis of «chronic bronchitis» is the exclusion of the other in a patient with chronic lung disease, occurring with symptoms of bronchitis. Infection plays a decisive role in the formation of chronic bronchitis in children. When the viruses exposed to the immature tissue structure the development of chronic inflammation in the bronchi is possible in early childhood [17,10]. Acute respiratory viral infections promote the accession of bacterial inflammation. Leading inflammatory agents currently considered Haemophilus influenzae, Streptococcus pneumoniae and Moraxella catarrhalis. The upper airways have mucociliary and immune system protection. It was revealed that H. influenzae, S. pneumoniae can damage the ciliary epithelium, impair the function of the cilia [6]. Reproduction of microorganisms contributes to the further progression of inflammation both through self-damage to the structure of the bronchus, and due to the activation of inflammatory cells enzymes[8]. This leads to panbronchitis and peribronchitis development [19], to the for-

mation of deforming bronchitis [3]. The diagnostics is often complicated due to the susceptibility of young children to recurrence of respiratory diseases which may disguise the development of chronic pathology and become the culprit in case of its delayed identification. Therefore, timely diagnosis and the establishment of the factors that contribute to the formation of chronic bronchitis options is an important reserve to increase the effectiveness of prevention and treatment and in some cases it make possible to prevent the transfer of acute bronchitis in recurrent and chronic, as well as to exclude irreversible changes in the broncho-pulmonary and heart vascular system, prevent early child disability [11]. Amongst several causes predisposing to the occurrence of obstructive and chronic bronchitis much attention should be paid to the disturbances in air passageway microbiocenosis and to the immune response of the body. It is also important to establish some risk factors which occurred during antenatal, perinatal and postnatal periods and to clear up the mechanisms of their action, to find out whether there is hereditary susceptibility to the disease, or some other environmental factors producing continual effect on the children (nutrition, living conditions, etc.) [6,8,19].

The aim of our research is to study the incidence rate of airway bacterial infection in children with obstructive and chronic bronchitis and to characterize the structure of pathogenic bacterial flora found in bronchoalveolar lavage (BAL), taken by bronchoscopy, as well as to define clinical forms of bronchitis more exactly.

Materials and methods. The study was performed at Kyiv Research Institute of Pediatrics, Obstetrics, and Gynecology. 105 children were enrolled; 55 with obstructive bronchitis and 50 with chronic bronchitis. They underwent clinical and laboratory investigations at the in-patient department of the infectious diseases hospital for younger children. The study was approved by the Bioethics Committee and consistent with the principles outlined in the Declaration of Helsinki (Br. Med. J. 1964; p.177). The parents of each child was given permission to conduct research. On admission to the hospital patients were carried out express diagnostics to find out viral antigens in upper airway lavages and aspirates by luminescent microscopy [3].

For this purpose, antibodies conjugated with fluorescein isothiocyanate (FITC) were used [16]. Also, microbiological testing conducted mucus of upper respiratory tract and bronchoalveolar lavage in order to evaluate the microbial spectrum and the susceptibility

of microorganisms to antibiotics. The bronchoalveolar lavage were received for analysis during the bronchoscopy, due to the aspiration through a sterile catheter into a sterile tube. The material from the nose and throat was taken by dry sterile swab on an empty stomach or not earlier than 2-3 hours after eating. Planting material was carried out no later than 2 hours after collection in the meat-culture media, blood, vitelline-salt agar, Endo and Saburo media. Mathematical processing of anamnestic and clinical data as well as laboratory findings was carried out by variational procedure to obtain mean magnitude (M), precision of its measurements (m), and standard deviation (δ). Comparing of mean deviations was calculated by Student's t test with a value of $p < 0.005$.

To assess the strength and directedness of correlations between the quantitative functional parameters we applied multivariate correlation analysis that allowed us to obtain the matrices of inter-correction coefficients. Their validity was estimated by using the tables of the correlation relevance [2].

The estimation of information value for clinical material and laboratory findings regarding the diagnostics of respiratory diseases and prediction of their consequences in young children was carried out by application of Kullback information criterion within sequential statistical analysis [1].

Mathematical processing by sequential statistical analysis included: calculation of frequency of occurrence for risk factors, signs and symptoms of diseases common in general totality of children with bronchitis and in some separated clinical groups; evaluation of a diagnostic coefficient value for each of risk factors, signs and symptoms.

Results. As a result of the study and comparative analysis of early history, clinical symptoms dynamics, as well as instrumental and laboratory examination of infants with respiratory disorders there were identified medical history, clinical, laboratory, infectious risk factors of chronic and obstructive bronchitis. Among the maternal medical history factors dominated: the first half pregnancy toxemia – 32,2%, the threat of termination – 30,3%, prematurity – 17,6%, the weakness of labor activity – 14.1% , extragenital pathology in the mother – 21.6% Among the features of the child's medical history were: varying degrees of asphyxia – 13.1%, early onset infection – 23.9%, the first episode of respiratory disease up to 3 months – from 33.9% of children, up to 1 year – from 80.6%. The majority of children who are ill in chronic bronchitis, the first disease was acute pneumonia or acute respiratory viral infection. In all the patients the course of underlying disease is complicated with concomitant diseases (from 2 to 10 conditions), among which the most common are rickets of the II stage (61.2%), thymus hyperplasia (57.6%), chronic tonsillitis (53.5%), drug allergy (46.2%), polyhypovitaminosis (33.9%), atopic dermatitis (31,8%), anemia (21.5%), food allergy (11.9%), intestinal dysbacteriosis (11.4%). The study of the dynamics of clinical symptoms in bronchitis and early detection of endo- and exogenous factors which produce unfavorable effect on the children's condition enables to make up the high risk groups of

the children. The determination of the risk factors intensity influencing upon the development of obstructive and chronic bronchitis allows us to specify criteria for differential diagnosis of different forms and types of bronchitis. The criteria are summarized and presented in the test sheets for the diagnostics of bronchitis and prediction of its consequences (**Table 1, 2**).

Table 1.

Informativity of risk factors in diagnostics of obstructive bronchitis and its prognosis

№	Signs	Diagnostic coefficient (DC)	Informative value
1	Irregular rales of various types in the lungs	- 4.5	1.74
2	Permanent rales of various types in the lungs	2.9	1.12
3	Catarrhal endobronchitis	- 4.4	1.04
4	Episodic cough of mucus or pus	- 2.5	0.42
5	Eosinophil- lymphocyte count (above normal)	2.1	0.34
6	Cesarean section	- 5.1	0.33
7	Nephropathy of pregnancy	4.1	0.32
8	Neutrophilosis	2.6	0.32
9	Catarrhal-purulent endobronchitis	1.4	0.32

Table 2.

Informativity of risk factors in the diagnostics of chronic bronchitis and its prognosis.

№	Signs	Diagnostic coefficient (DC)	Informative value
1	Catarrhal endobronchitis	- 8,9	3,63
2.	Irregular rales of various types in the lungs	- 5,5	2,20
3	Intestinal dysbacteriosis	5,9	1,70
4	Permanent rales of various types in the lungs	2,8	1,14
5	Catarrhal-purulent endobronchitis	2,5	1,0
6	Episodic cough of mucus or pus	- 4,2	0,98
7	Breathlessness	3,0	0,68
8	Atopic dermatitis	- 3,3	0,62
9	Thymus hyperplasia	- 2,3	0,58
10	Eosinophil- lymphocyte count (above normal)	2,6	0,53
11	Pneumonia in neonatal period	7,3	0,47
12	Uraturia	- 4,8	0,38
13	Hepatomegaly	3	0,38
14	Permanent cough of mucus or pus	1,4	0,31

Table 3.
**Dependence of over-diagnosing/
 under-diagnosing resultant error
 on the value of the sum of the diagnostic
 coefficients (DC)**

DC sum	Error	DC sum	Error	DC sum	Error
19.96	1	11.95	6	9.08	11
16.90	2	11.23	7	8.65	12
15.10	3	10.61	8	8.26	13
13.80	4	10.05	9	7.88	14
12.79	5	9.54	10	7.53	15

They may help pediatricians to detect the disease in its early stages and to plan proper therapeutic approach for young children. This also may help to avoid the hospitalization and to considerably promote the therapeutic effectiveness and rehabilitation for the patients in pre-hospitalization period.

These **tables** show the characteristics of informative value regarding diagnosis prognosis, and outcomes for bronchitis of different clinical forms in early childhood: the positive diagnostic factors that characterize the possibility of this disease; the negative diagnostic coefficients can be used to predict the outcome. Diagnostic factors are placed in descending order of their information. Using these tables, you can estimate the probability of diagnosis in this patient, and by comparison of the diagnostic factors (for a maximum total score) to take a final diagnostic decision. comparing the values of diagnostic coefficients to confirm the final diagnosis. On the basis of Wald sequential procedure (Wald's test) the decision-making algorithm suggests the estimated probability of the correct diagnosis by comparing the sum of DC and preset threshold. The last is determined by prescribed level of errors in over-diagnosing and under-diagnosing. We have worked out the algorithm which allows us to estimate the diagnosis error probability directly by the sum of diagnostic factors. The obtained results are easy to use as shown in **Table 3**.

The degree of viruses influence on the different clinical forms of bronchitis formation was evaluated according to the data which were obtained in patients with virological examination for the presence of viral antigens. The presence of viral antigens in 39.5% of children gives us grounds to consider viral infection starting point in the exacerbation of the inflammatory process in the respiratory system of patients with these groups. In most cases (74.5%), viral pathogens were a monoinfection (respiratory syncytial (RS), adenovirus, influenza, parainfluenza). The detection of viral antigens in children during the remission points toward their persistence in the patient's body, that has been proven by some other researches [16]. The range of microbial associations is characterized by increasing levels of opportunistic pathogens contributing to the microbiocenosis disturbances, as well as presence of *S.aureus*, *S.pneumoniae*, *S.purulent*, *E. coli*, *Klebsiella*, *H.influenzae* and *Ps.aeruginosae*, fungus *Candida* in high diagnostic concentrations – 105-107

in 1 ml of MBC secret, pathogenic signs of aggression (hemolytic, plasma-coagulation, lecithinase properties, antibiotic resistance). In the broncho-alveolar lavage of children with chronic bronchitis, significantly more *S.pneumoniae*, *H.influenzae* and *Ps.aeruginosae* were allocated than in the upper respiratory tract mucus. While in obstructive bronchitis *H.influenzae* та *Ps.aeruginosae* ($p<0.005$) are significantly more often detected (**Fig.**). There were significantly more frequent release of these agents in dynamic than in the primary crops.

Summary and conclusions. A considerable amount of scientific papers is devoted to respiratory diseases in children, including bronchitis [5,7,17]. However, these studies relate mainly to older children, while the main causes of the formation and chronic obstructive bronchitis with relapsing are already at an early age. The clinical picture of the various forms of bronchitis is characterized by polymorphism of clinical symptoms common to all forms of bronchitis, so the differential diagnosis of these diseases is some difficulty. We have introduced the concept of obstructive or chronic bronchitis formation in infants, which feature is the recognition of the impact in this process the group of risk factors operating in the ante, peri- and postnatal periods, family history of allergies and exogenous factors. The effect of these factors on the development of chronic and obstructive bronchitis is the basis for the development of diagnostic criteria, differential diagnosis and prediction of the effects of bronchitis in infants. The developed criteria presented in the form of test tables, suitable for use in children's clinics practitioners (**Table 1, 2, 3**). Cultural properties of crops from the upper and lower respiratory tract in patients with different groups have different structure of the microbial landscape: associations of micro-organisms and their composition, a kind of bacteria, the number of species and the concentration of each of them. Due to the complexity of the pathological process in the bronchi of children with obstructive chronic bronchitis the total number of gram-positive cocci cultures were reduced, while the appearance *St.aureus*, *S. pneumoniae* and *S. purulent* increases. These changes are also accompanied by the disap-

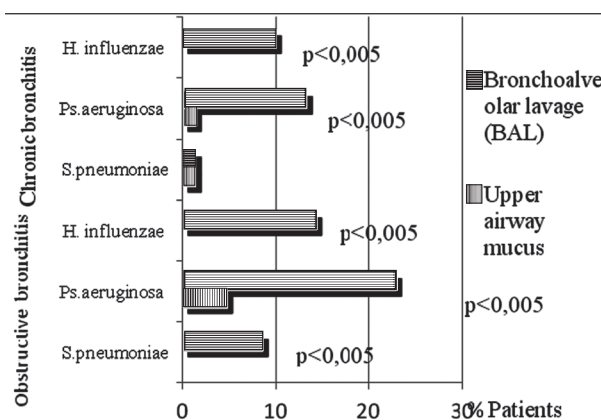


Figure. Bacteriological analysis of bronchoalveolar lavage and upper respiratory tract mucus obtained in patients with chronic bronchitis and obstructive bronchitis.

pearance of the mucosa of the respiratory tract of highly specific microbes-antagonists and replacing them with representatives of pathogenic and opportunistic species that are not typical for normal microbiocenosis of this biotope [14,8,19]. Therefore, we can conclude that the nature of the microbial landscape of the throat, trachea and bronchi has features that depend on the depth and the extent of broncho-pulmonary system tissue damage and find their reflection in the clinical features of various forms of bronchitis in infants. Probably the main reason for the existence of a dynamic difference between the bacterial microflora in bronchoalveolar lavage and upper respiratory tract mucus is the persistence of microorganisms and activity of the inflammatory process in the bronchi. This is due to inadequate treatment, lack of or weak susceptibility to antibiotics, selection of resistant strains and autoflora activation on

the background of ventilation and the respiratory tract perfusion damage. The analysis of bacteriological examinations in children with obstructive or chronic bronchitis, and taking into account the dynamics revealed significant violations microbiocenosis and dominant microbial associations of the upper and lower respiratory tract, which allows to justify the indications for etiopathogenetic therapy in children with this disorder.

The prospect of further action. The results of this study can be used to create valid prospective model of chronic or obstructive bronchitis considering anamnesis, clinical, laboratory and infectious risk factors. The analysis of the spectrum of bronchoalveolar lavage and upper respiratory tract mucus microflora can be the basis for the development of the revised schemes of antibiotic therapy of these diseases.

REFERENCES

1. Гублер Е. В. Вычислительные методы анализа и распознавания патологических процессов / Е. В. Гублер. – Л.: Медицина, 197
2. Иберла К. Факторный анализ. Перевод с немецкого / К. Иберла. – М.: Статистика, 1980. – С. 298.
3. Мотуз Т. А. Люминесцентный метод определения иммуноглобулинов в слизистой верхних дыхательных путей в связи с выявлением вирусных антигенов / Т. А. Мотуз, Н. И. Нетреба // В кн.: Эпидемиология и профилактика вирусных инфекций. Материалы республиканской научной конференции. – Одесса, 1975. – С.133-134.
4. Рачинский С. В. Болезни органов дыхания у детей / С. В. Рачинский, В. К. Таточенко // Руководство для врачей. – 2004. – М.: Медицина. – С. 496.
5. Таточенко В. К. Рецидивирующий обструктивный бронхит / В. К. Таточенко // Практическая пульмонология детского возраста (справочник). – 2000. – С.105-110.
6. Холодок Г. Н. Состояние микробиотоза слизистых оболочек дыхательных путей у детей Приамурья / Г. Н. Холодок, В. К. Козлов, А. В. Краковская [и др.] // Новые медицинские технологии. – М.: Медиздат. – 2010. – № 2. – С.29-34.
7. Чебуркин А. В. Часто и длительно болеющие дети: современные возможности иммунореабилитации: Рук-во для врачей / А. В. Чебуркин, Н. А. Коровина, А. Л. Заплатников // Рук-во для врачей. – Москва, 2001 – С.23.
8. Chang AB. A bronchoscopic scoring system for airway secretions – airway cellularity and microbiological validation / AB. Chang, J. Faoagali, NC Cox [et al] // *Pediatr Pulmonol.* – 2006. – № 41(9). P. 887-892.
9. Chang AB. Cough in children / AB. Chang, C. F. Robertson // *Med J Aust.* – 2000. – № 172(3). – P. 122-125.
10. Chang AB. Diagnosing and preventing chronic suppurative lung disease (CSLD) and Bronchiectasis / AB. Chang, CA Byrnes, ML Everard // *Paediatric Respiratory Reviews.* – 2011. – № 12. – P. 97-103.
11. Chang AB. Guidelines for evaluating chronic cough in pediatrics: ACCP evidence-based clinical practice guidelines / AB. Chang, WB Glomb // *Chest.* – 2006. – № 129(suppl 1). – P. 260-283.
12. Chang AB. Pulmonary Innate Immunity in Children with Protracted Bacterial Bronchitis / AB. Chang, ST Yerkovich, PG Gibson, [et al] // *The Journal of Pediatrics.* – 2012. – № 161(4). – P. 621-625.
13. Kompore M. Characteristics of chronic purulent bronchitis in young children / M. Kompore, M. Weinberger // *Chest.* – 2010. – № 138. – P. 807.
14. Marchant JM. Evaluation and outcome of young children with chronic cough / JM. Marchant, IB Masters, SM Taylor [et al] // *Chest.* – 2006. – № 129(5). – P. 1132-1141.
15. Marchant JM. Prospective assessment of protracted bacterial bronchitis: airway Inflammation and innate immune activation / JM. Marchant, PG Gibson, TV Grissell [et al] // *Pediatric Pulmonology* – 2008. – № 43. – P. 1092-1099.
16. Marchant JM. Utility of signs and symptoms of chronic cough in predicting specific cause in children / JM. Marchant, IB Masters, SM Taylor [et al] // *Thorax.* – 2006. – № 61(8). – P. 694-698.
17. Redding GL. Childhood bronchiectasis around the world / GL. Redding // *Paediatr Respir Rev.* – 2010. – № 11. – P. 73.
18. Shields MD. British Thoracic Society Cough Guideline Group. Recommendations for the assessment and management of cough in children / MD. Shields, A. Bush, ML Everare [et al] // *Thorax.* – 2008. – № 63. – P. 1-15.
19. Stralin K. Evaluation of a multiplex PCR for bacterial pathogens applied to bronchoalveolar lavage / K. Stralin, J. Korsgard, P. Olcen P // *Eur Respir J.* – 2006. -№ 28(3). – P. 568-575.

УДК 616-002:616.233-002.2./007.272]-053.2

БРОНХОСКОПІЧНІ ЗНАХІДКИ У ДІТЕЙ З ХРОНІЧНИМИ ТА ОБСТРУКТИВНИМИ БРОНХІТАМИ

Фесенко М. Є., Похилько В. І., Зюзіна Л. С., Калюжка О. О., Чернявська Ю. І.

Резюме. Метою дослідження було вивчення частоти бактеріального інфікування дихальних шляхів у дітей з обструктивним і хронічним бронхітами та аналіз структури патогенної бактеріальної флори промивних вод при бронхоскопічному дослідженні. Були проведені клініко-лабораторні обстеження 105 дітей раннього віку з різними клінічними формами бронхітів (55 з обструктивним та 50 з хронічним бронхітами). В роботі визначена роль прогностично несприятливих клінічних симптомів бронхітів, ендо- та екзогенних факторів ризику формування груп дітей з рецидивуючими та хронічними захворюваннями, розроблені критерії диференціальної діагностики та прогнозування наслідків бронхітів у дітей раннього віку. Аналіз результатів бактеріоло-

гічного дослідження показав, що *S.pneumoniae*, *H.influenza* і *Ps.aeruginosa* достовірно частіше виділялись із промивних вод бронхів, ніж із слизу верхніх дихальних шляхів ($p<0,005$). В міру ускладнення патологічного процесу у бронхах загальна кількість культур грампозитивних коків зменшується, з одночасним збільшенням окремих видів *S.aureus* та *S.purulent* і загальної кількості грамнегативних паличок.

Ключові слова: хронічний бронхіт, обструктивний бронхіт, діти раннього віку, інфекція.

УДК 616-002:616.233-002.2./007.272]-053.2

БРОНХОСКОПИЧЕСКИЕ НАХОДКИ У ДЕТЕЙ С ХРОНИЧЕСКИМ И ОБСТРУКТИВНЫМ БРОНХИТАМИ **Фесенко М. Е., Похилько В. И., Зюзина Л. С., Калюжка Е. А., Чернявская Ю. И.**

Резюме. Целью исследования было изучение частоты бактериального инфицирования дыхательных путей у детей с обструктивным и хроническим бронхитами и анализ структуры патогенной бактериальной флоры промывных вод бронхов при бронхоскопическом исследовании. Были проведены клинико-лабораторные обследования 105 детей раннего возраста с различными клиническими формами бронхитов (55 с обструктивным и 50 с хроническим бронхитами). В работе определена роль прогностически неблагоприятных клинических симптомов бронхитов, эндо и экзогенных факторов риска формирования групп детей с рецидивирующими и хроническими заболеваниями, разработаны критерии дифференциальной диагностики и прогнозирования последствий бронхитов у детей раннего возраста. Анализ результатов бактериологического исследования показал, что *S.pneumoniae*, *H.influenzae* и *Ps.aeruginosae* достоверно чаще выделялись из промывных вод бронхов, чем из слизи верхних дыхательных путей ($p<0,005$). По мере усложнения патологического процесса в бронхах общее количество культур грамположительных кокков уменьшается с одновременным увеличением отдельных видов *S.aureus* и *S.purulent* и общего количества грамотрицательных палочек.

Ключевые слова: хронический бронхит, обструктивный бронхит, дети раннего возраста, инфекция.

UDC 616-002:616.233-002.2./007.272]-053.2

BRONCHOSCOPIC FINDINGS IN CHILDREN WITH OBSTRUCTIVE AND CHRONIC BRONCHITIS

Fesenko M. Ye., Pokhylo V. I., Zjuzina L. S., Kaljuzhka O. O., Chernyavska Yu. I.

Abstract. The aim of our research was to study the incidence rate of airway bacterial infection in children with obstructive and chronic bronchitis and to characterize the structure of pathogenic bacterial flora found in bronchoalveolar lavage obtained in bronchoscopic investigation, as well as to define clinical forms of bronchitis more exactly. 105 children were enrolled (55 with obstructive bronchitis and 50 with chronic bronchitis). The study based on the investigation and comparison of early medical history, clinical symptomatology, instrumental and laboratory findings enables to establish the role of unfavorable prognostic symptoms for bronchitis, the significance of endo- and exogenous risk factors predisposing to the recurrence of the disease or to its turning into chronic form. Among the maternal medical history factors dominated: the first half pregnancy toxemia – 32,2%, the threat of termination – 30,3%, prematurity – 17,6%, the weakness of labor activity – 14.1% , extragenital pathology in the mother – 21.6% Among the features of the child's medical history were: varying degrees of asphyxia – 13.1%, early onset infection – 23.9%, the first episode of respiratory disease up to 3 months – from 33.9% of children, up to 1 year – from 80.6%. In all the patients the course of underlying disease is complicated with concomitant diseases (from 2 to 10 conditions), among which the most common are rickets of the II stage (61.2%), thymus hyperplasia (57.6%), chronic tonsillitis (53.5%), drug allergy (46.2%), polyhypovitaminosis (33.9%), atopic dermatitis (31.8%), anemia (21.5%), food allergy (11.9%), intestinal dysbacteriosis (11.4%). The impact produced by these factors on the occurrence of obstructive and chronic bronchitis underlies the elaboration of criteria for diagnosis, differential diagnosis of bronchitis as well as for the prediction of its consequences in young children. The criteria are summarized and presented in the test sheets which are easy-to-use in pediatric practice. The analysis of bacteriologic tests has shown the microbial associations of bronchoalveolar lavage and upper air passageways mucus are mainly identical, but some their indices differ. The major cause that determines this difference is the persistence of pathogens and the inflammation activity in the bronchi. Such pathogens as *S.pneumoniae*, *H.influenza* and *Ps.aeruginosa* are significantly more often isolated in bronchoalveolar lavage than in the upper air passageway mucus ($p<0,005$). As the pathologic process becomes complicated the total amount of gram-positive cocci decreases in bronchi of the children with obstructive and chronic bronchitis, although some species such as *S.aureus* та *S.purulent* are observed to grow at the same time. Simultaneously the total amount of gram-negative bacilli is growing. Thus, the microbial landscape of the upper and lower respiratory tract has its own distinctive features which depend on the intensity and the extent of broncho-pulmonary affection and influence upon the clinical course of different types of bronchitis in young children. The criteria for the differential diagnosis of obstructive and chronic bronchitis in young children and prediction of its consequences have been proven to be of high informative value. We have identified considerable disturbances in microbiocenosis within the course of the disease and the predominance of microbial associations in the upper and lower respiratory tract. *S.pneumoniae*, *H.influenza* and *Ps.aeruginosa* are significantly more often isolated in bronchoalveolar lavage than in the upper airway mucus ($p<0.005$). The analysis of bacteriological examinations in children with obstructive or chronic bronchitis, and taking into account the dynamics revealed significant violations microbiocenosis and dominant microbial associations of the upper and lower respiratory tract, which allows to justify the indications for etiopathogenetic therapy in children with this disorder.

Keywords: chronic bronchitis, obstructive bronchitis, young children, infection.

Рецензент – проф. Крючко Т. О.

Стаття надійшла 05.10.2015 р.