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THE MAIN POINTS OF THE ETIOPATHOGENESIS OF THE DEVELOPMENT OF OBSTRUCTIVE BRONCHITIS IN CHILDREN, DEPENDING ON THE ETIOLOGY

Assistant Kudratova Z.E.;

MD, head of department Muxamadiyeva L.A.;

Assistant Umarova S.S.;

Assistant Umarova T.A.

Samarkand State Medical University

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Abstract. The paper presents the analysis of literature about the peculiarities of etiopathogenesis of obstructive bronchitis and laryngotracheitis caused by atypical microflora. In pediatric practice the most frequent respiratory tract diseases are obstructive bronchitis and acute laryngotracheitis. Relevance of the problem of obstructive bronchitis acute laryngotracheitis is associated with the frequency of bacterial complications, development of life-threatening conditions due to its prevalence in viral infections in children, as well as the presence of atypical bacterial pathogens. Modern ideas about the etiopathogenesis of obstructive bronchitis and acute laryngotracheitis assume the development of the pathological process as a result of the complex influence of various infectious and allergic factors [5,11].

Key words: obstructive bronchitis, mycoplasma infection, chlamydial infection, resistance, laryngotracheitis.

ОСНОВНЫЕ МОМЕНТЫ ЭТИОПАТОГЕНЕЗА РАЗВИТИЯ ОБСТРУКТИВНОГО БРОНХИТА У ДЕТЕЙ В ЗАВИСИМОСТИ ОТ ЭТИОЛОГИИ

Аннотация: В статье представлен анализ литературы об особенностях этиопатогенеза обструктивных бронхитов и ларинготрахеитов, вызванных атипичной микрофлорой. В педиатрической практике наиболее частыми заболеваниями дыхательных путей являются обструктивный бронхит и острый ларинготрахеит. Актуальность проблемы острого ларинготрахеита обструктивного бронхита связана с частотой бактериальных осложнений, развитием жизнеугрожающих состояний в связи с его распространенностью при вирусных инфекциях у детей, а также наличием атипичных бактериальных возбудителей. Современные представления об этиопатогенезе обструктивного бронхита и острого ларинготрахеита предполагают развитие патологического процесса в результате комплексного воздействия различных инфекционно-аллергических факторов [5,11].

Ключевые слова: обструктивный бронхит, микоплазменная инфекция, хламидийная инфекция, резистентность, ларинготрахеит.

INTRODUCTION

According to research results, respiratory diseases in children are the most common reason for visiting pediatricians. Despite numerous studies, the significance of atypical pathogens in the development of obstructive bronchitis and laryngotracheitis in infectious and allergic pathology in preschool and school-age children remains insufficiently investigated [1,2].

MATERIALS AND METHODS

The term "atypical" respiratory tract infections was first introduced in 1940 to refer to a group of diseases of unidentified etiology [4,5].

Modern medical nomenclature primarily considers the microorganisms of the genus *Chlamydia pneumoniae* and *Mycoplasma pneumoniae* as "atypical" [4,5,9]. The above intracellular pathogens can cause both the occurrence of chronic or frequently recurrent infectious respiratory tract disease, and be the cause of its exacerbation, development of severe versions of the course [3,4,5].

Mycoplasma infection of the respiratory tract occurs in 22% of cases, while chlamydial infection is diagnosed much less frequently - in 4% of cases [6].

Chlamydia pneumoniae and *Mycoplasma pneumoniae* are common pathogens that cause acute illness in both the upper and lower respiratory tracts. Several observations support a possible causal role of these pathogens in bronchoobstructive syndrome and in the development of laryngotracheitis, but more evidence is needed before this becomes meaningful in clinical practice [7,8,9].

The pathogenesis of mycoplasma and chlamydia infections has many similarities. Antibodies bind to homologous tissue antigens, form immune complexes, attach complement components, have an effect that damages cell membranes and cause local and generalized immune reactions. By attaching to erythrocytes and causing their hemolysis, mycoplasmas expose latent AGs, to which cold agglutinins are synthesized. Erythrocyte agglutination and hemolysis lead to microcirculatory disorders and thrombus formation. Circulating immune complexes attached to the vessel walls are also involved in the process. When chlamydiae enter the body, local colonization of the pathogen occurs in the conjunctiva of the eyes as well as in the mucous membranes of the respiratory (*C. pneumoniae*, *C. psittaci*) and urogenital (*C. trachomatis*) tracts. The colonization process is accompanied by the development of the corresponding clinical picture of the local lesions of the target organ. Further distribution of chlamydia in the body occurs with the help of blood monocytes. The latter absorb the pathogen and transfer it to the joints, lymph nodes, blood vessels, heart, lungs and other distant organs, where it is deposited as tissue macrophages capable of living for several months. Settled microbial macrophages can initiate the development of a granulomatous process and eventually lead to fibrotic-sclerotic tissue changes [1, 3, 9,12,13].

A special role in the regulation of local protective reactions in tissues is given to cytokines [1, 3]. Cytokine production in response to various exogenous agents is genetically determined. According to the most recent data, differences in the genes that control the body's defense reactions can affect the level of cytokine production and thereby the nature of the development and progression of the immune response [4,7]. Studies in recent years have shown that in the acute inflammatory response, the airway epithelium itself has a prominent and active role, releasing pro- and anti-inflammatory mediators [1,8]. Epithelial cells have been shown to release mediators such as granulocyte macrophage colony stimulating factor (GMSF), interleukin (IL)-8, 15-hydroxyecosatetraenoic acid (15-HETA), tumor necrosis factor (TNF). In lung diseases cytokines, participating in infectious-inflammatory reactions and allergic response at the level of a specific effector component, have a significant impact on the formation, severity and prognosis of the pathological process [5,7]. Systemic inflammation is a frequent link in the pathogenesis of obstructive lung disease and obesity [1,9]. During inflammation, all cellular elements are activated and release cytokines -inflammatory cell chemotaxis factors or inflammatory mediators. Cytokines induce an acute inflammatory response and can have immunopathological effects on cells and tissues, ensuring consistency, harmony and completeness of the immune response [1,2]. Normally, after the development of a systemic reaction, anti-inflammatory cytokine cascades are released

into the systemic bloodstream. The most active are IL-4, IL-10. They also inhibit the secretion of inflammatory phase mediators by macrophages.

RESULTS AND DISCUSSION

The body's protection against infection is determined by the following three key points, which influence and define each other: natural resistance, early response and adaptive, or acquired, immunity. After a microbe penetrates the body, protection is determined by a system of cellular and humoral factors [2,9, 10].

Atypical bacteria may increase airway hyperresponsiveness and local inflammation. It is less clear whether the above mechanisms may also be responsible for the development of obstruction. Difficulties in accurately diagnosing these infections contribute to this uncertainty [9,10].

CONCLUSIONS

Modern laboratory diagnosis of chlamydial and mycoplasma respiratory tract infections in children is rather complicated, requiring a single detection of both antigen and antibodies, and control of serological parameters over time [6,10]. Along with the detection of chlamydial and mycoplasma infections in the body, the patient's immune status must be assessed, since 70-80% of those who are ill have changes in it, with the interferon and phagocytosis systems and the cellular link being the most important ones [9,10,13].

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