

The State of Local Immunity of the Mucous Membrane of the Larynx in Children is Normal and with Stenosing Recurrent Laryngotracheitis

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ABSTRACT

Features of the child's body: lability of interstitial metabolism, increased hydrophilicity of tissues, exhaustion of compensatory systems, etc. They can cause a rapid manifestation of the pathological condition. One of the frequent and severe manifestations of acute respiratory viral infections in infants, accompanied by respiratory distress, is acute stenosing laryngotracheitis. To study changes in indicators of local immunity of the mucous membrane of the larynx in patients with recurrent acute laryngotracheitis. We examined 36 sick children diagnosed with acute stenosing recurrent laryngotracheitis and 20 practically healthy children aged 2 to 5 years. When evaluating the correlation relationships, it was found that local immunity of the mucous membrane of the larynx is provided by the coordination of the work of the cellular link (neutrophils and epithelial cells) and humoral factors (immunoglobulins, VPA). From all this it follows that in healthy children, local immunity of the mucous membrane of the larynx is represented by neutrophils and antibodies. Adaptation is characterized by an increase in the functional properties of neutrophils and a slight increase in IgE production. Thus, in patients with acute and recurrent laryngotracheitis, the immune response of the mucous membrane of the larynx is characterized by the activation of humoral factors (antibodies and VPA), the absence of significant changes on the part of the cellular link, there is an increase in destructive processes affecting both epithelial and immunocomponent cells-neutrophils, the degree of immune response increases in sick children with multiple recurrent laryngotracheitis.

KEYWORDS: *recurrent stenosing laryngotracheitis, local immunity, phagocytosis and destruction.*

In recent years, against the background of an increased frequency of acute respiratory viral infections (ARVI) in children, the attention of pediatricians and otorhinolaryngologists has been attracted by acute and recurrent stenosing laryngotracheitis. Since the leading role in the occurrence of these diseases belongs to viruses. Features of the child's body: lability of interstitial metabolism, increased hydrophilicity of tissues, exhaustion of compensatory systems, and others. They can cause a violent manifestation of a pathological condition. One of the frequent and severe manifestations of acute respiratory viral infections in infants, accompanied by respiratory distress, is acute stenosing laryngotracheitis.

In addition, given that the peak of this disease occurs at the age of 2-4 years, it becomes clear that this circumstance is associated with the low protection of the mucous membranes of the child and the relatively weak local immunity of his mucous membranes. The barrier function of the mucous membranes of the respiratory tract, including the larynx, associated with the immunological mechanism in this continent of children is very weak. The available studies on the features of local immunity of the mucous membrane of the pharynx and larynx were mainly carried out in adults. There are few works devoted to the study of local immunity of the mucous membranes in children and mainly concerns the issues of a comparative analysis of general and local immunity in the pathology of the nasopharyngeal tract. In practice, the issue of adaptation of the immune system of the mucous membrane of the larynx in children in normal and pathological conditions remains poorly understood. And we did not find works devoted to the study of local immunity of the mucous

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membrane of the larynx in recurrent laryngotracheitis in children in the literature available to us.

In this regard, the purpose of our study was to identify the characteristics of the immunity of the mucous membrane of the larynx in healthy children and patients with recurrent acute laryngotracheitis. To achieve this goal, we have set the following tasks:

1. To assess the state of local immunity of the mucous membrane of the larynx in practically healthy children.
2. To study changes in indicators of local immunity of the mucous membrane of the larynx in patients with recurrent acute laryngotracheitis.

Materials and methods of research: We examined 36 sick children diagnosed with acute stenosing recurrent laryngotracheitis and 20 practically healthy children aged 2 to 5 years. The study was conducted on the basis of the 3-infectious hospital in Tashkent in the departments of acute respiratory viral infections and laryngotracheitis. Blood, swabs from the surface of the vocal folds, reprint smears from the surface of the mucous membrane of the larynx in practically healthy children and in patients with acute and recurrent laryngotracheitis were subjected to the study.

In laryngeal swabs, the level of immunoglobulins G, A, M, E was determined by ELISA, extracellular peroxidase activity according to L.F. Aznabaeva, and the level of albumin was calculated by the relative secretion coefficient (RSC) of antibodies in laryngeal swabs using a special formula.

Cellular factors of local immunity of the mucous membrane of the laryngeal cavity were studied according to immunocytochemicals. In practically healthy children, various forms of leukocytes and epithelial cells were revealed, while the prevalence of epithelial cells over leukocytes was noted. Leuko-epithelial index was 1:6-1:5, leukocytes were mainly represented by neutrophils, epithelial cells consisted mainly of squamous epithelium. Squamous epithelial cells in cytograms were mostly without signs of destruction (o-class 88.11±2.79%). Neutrophils in the vast majority were represented by cells of 0 and 1 destruction classes (82.99±4.53%). The study of the functional activity of neutrophils showed the ability of cells to phagocytosis of the microflora of the laryngeal cavity, which amounted to approximately one third of their total number.

The study of humoral factors of local immunity in swabs from the mucous membrane of the larynx in practically healthy children showed a predominant content of class E immunoglobulins, which amounted to about 40%. A smaller amount contained Ig A-30% and a small amount of Ig G and Ig M 26% and about 4%, respectively.

In addition, the activity of extracellular peroxidases was noted, which have antimicrobial functions, contributing to the extracellular oxidative effect on microorganisms and thereby enhancing the effects of phagocytosis and destruction (elimination of cells contaminated with an infectious onset). When evaluating the relative secretion coefficient (RSC), it was found that the level of antibodies in the swabs from the mucous membrane of the larynx of practically healthy children was provided by the local synthesis of SIgA, IgE and IgA and sweating from the bloodstream of IgG and IgM.

When evaluating the correlation relationships, it was found that local immunity of the mucous membrane of the larynx is provided by the coordination of the work of the cellular link (neutrophils and epithelial cells) and humoral factors (immunoglobulins, VPA). From all this it follows that in healthy children, local immunity of the mucous membrane of the larynx is represented by neutrophils and antibodies. Adaptation is characterized by an increase in the functional properties of neutrophils and a slight increase in IgE production. Disadaptation of the immune response is accompanied by a decrease in the production of antibodies and the functional ability of neutrophils. Comparative evaluation of quantitative indicators of immunocytochemicals of smears from the mucous membrane of the larynx of sick children with acute and recurrent laryngotracheitis did not reveal pronounced

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differences from the data of practically healthy children. However, the assessment of the functional state of cells by studying the integrity of membranes, the stage of destruction of neutrophils and squamous cells, differences were noted. In patients with recurrent laryngotracheitis, the number of destroyed neutrophils increased, cells were mainly represented by classes 1,2 and 3, the representation of class 0 cells significantly decreased, this was especially noticeable in children with frequent recurrent laryngotracheitis (P 0.05), there was a tendency to increase functional neutrophil activity, phagocytosis indicators slightly increased (p0.05). Epithelial cells made up the majority and consisted mainly of squamous epithelium of 0.1 and 2 destruction classes, however, there were significantly fewer intact cells of class 0 than in healthy children (p0.05).

The complex of clinical indicators of cellular representation according to the immunocytogram did not differ from the data of practically healthy children. However, the functional state of the cells indicated a tendency to activate the phagocytic properties of neutrophils and a high degree of destruction of both neutrophils of the main immunocomponent cells that provide the first line of defense and epithelial cells that ensure the integrity of the mucosal integument. More pronounced destructive changes were found in multiple recurrent laryngotracheitis. The study of the content of the main classes of immunoglobulins, the level of extracellular peroxidase activity (VPA) in swabs from the mucous membrane of the larynx in patients with acute and recurrent laryngotracheitis, a pronounced activation of humoral factors of local immunity. Reliably and significantly in the group of repeatedly recurrent laryngotracheitis, the level of all classes of immunoglobulins and VPA increased.

Thus, in patients with acute and recurrent laryngotracheitis, the immune response of the mucous membrane of the larynx is characterized by the activation of humoral factors (antibodies and VPA), the absence of significant changes in the cellular level, there is an increase in destructive processes affecting both epithelial and immunocomponent cells-neutrophils, the degree immune response is enhanced in sick children with multiple recurrent laryngotracheitis.

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