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Article

ABOUT MODERN METHODS OF TREATMENT OF ACUTE STENOSING LARYNGOTRACHEITIS IN CHILDREN

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Annotation: Acute infectious and inflammatory processes in the upper respiratory tract still form the main list of diseases in childhood, which maintains the constant interest in this pathology of specialists in various fields, such as pediatricians, infectious disease specialists, otorhinolaryngologists, allergists, and immunologists. Particular attention of researchers and clinicians is attracted by the study of the etiopathogenetic mechanisms of the occurrence of laryngotracheitis, which is caused, first of all, by the development of a life-threatening condition of acute stenosis of the respiratory tract in children. According to our observations and according to the literature, there has recently been a clear trend towards an increase in the frequency of repeated episodes of acute stenosing laryngotracheitis (ASLT) in children, which makes it obvious that further study of the underlying mechanisms of not only the occurrence, but also the recurrence of ASLT is necessary. Recurrence of laryngotracheitis contributes to the formation of chronic inflammatory processes and hyperreactivity of the upper respiratory tract, negatively affects the maturation of the child's immune system, which leads to the development of secondary immunosuppression. Each new respiratory infection provokes more and more serious disorders of the immune system, contributing to the formation of both chronic inflammatory diseases of the pharynx and respiratory allergies. The modern concept of the etiopathogenesis of laryngotracheitis takes into account the action of multiple infectious and allergic trigger factors, the most significant in immunocompromised children. Currently, the primary tasks awaiting solution are timely prevention and diagnosis, the provision of highly qualified medical care, including bronchopulmonary diseases in children by expanding the use of modern methods of diagnosis and treatment, which will improve the quality of life of children.

Key words: acute stenosing laryngotracheitis, childhood, etiopathogenesis, treatment methods

Introduction. The urgency of the problem of acute stenosing laryngotracheitis (ASLT), which accompanies acute respiratory viral infections, is due to its high prevalence in childhood, pronounced dynamism of clinical symptoms, the possibility of rapid development of bacterial complications and death. The modern concept of the pathogenesis of recurrent ASLT provides for the development of a pathological process as a result of the complex effect of various etiological factors, including infectious, allergic ones, however, until now, laboratory diagnostics of the latter in practice has not become widespread. The main pathogenetic mechanisms that form respiratory disorders: swelling of the mucous membrane of the larynx and trachea, spasm of the muscles of the larynx, trachea and bronchi, hypersecretion of the glands of the mucous membrane of the larynx, trachea and bronchi, become the leading ones that determine the clinic, and ultimately therapy.It should be noted that the search for new approaches to ASLT therapy, which would allow influencing both the etiological and pathogenetic mechanisms of the disease, remains relevant so far.

When analyzing the literature on the treatment of ASLT, the greatest number of different views of clinicians on this problem was

found [1]. A necessary condition for the successful treatment of ASLT is the mandatory transportation of the child to the hospital. Children with compensated and subcompensated ASLT should be hospitalized in the infectious-box departments of children's hospitals. Treatment of decompensated forms is carried out in intensive care units. A number of authors adhere to the point of view that a specialized laryngitis department based on a multidisciplinary children's hospital is the most rational form of providing assistance to patients with acute laryngotracheitis [2].

Results end Discussion. In recent years, various methods have been proposed for the treatment of children with acute respiratory viral infection, which occurs with symptoms of stenosing laryngotracheitis. So far, questions about the appropriateness of certain methods of treatment have been discussed [2, 3]. It must be remembered that glucocorticoids, especially those used for a long time and in high doses, cause hormonal immunosuppression and the progression of the inflammatory process in the presence of bacterial flora. And if we take into account that, according to the majority of authors, with ASLT in the stage of laryngeal stenosis I-II, it is possible to achieve a positive clinical effect without the use of steroid hormones.Some investigators prescribed sedative therapy (valerian, relanium, 1-3% sodium bromide solution, pipolfen, sodium hydroxybutyrate, etc.) during ASLT in order to relieve psychomotor agitation. There is a lot of controversy about the use of antibiotics in this disease. There are studies that have shown a high prevalence of persistent chlamydial infection in children with recurrent stenosing laryngotracheitis. The authors propose to use «new» macrolides with a wide spectrum of action (including against chlamydia) - sumamed, rulid, rovamycin, josamycin (vilprafen).

VF Uchaikin with co-authors, noting that the main cause of stenosis of the larynx in children is influenza or parainfluenza infection, as an etiotropic method of treatment suggests the use of a complex homeopathic preparation Aflubin. At the same time, the scientist notes that in each case, especially with croup syndrome in a child, it can be difficult to exclude the role of the bacterial flora. And the use of Aflubin against the background of antibiotic therapy significantly reduces the time of its implementation and reduces the frequency of side effects of the antibiotic [4].

The need for immunotherapy in the period of convalescence is indicated by many authors. The duration of immunotherapy courses and the choice of the drug is determined by the presence of an etiotropic pathogen and concomitant microflora, the prevalence of the inflammatory process, and the age of the child [5]. Literature data indicate an increasing incidence of the disease among children, the lack of 100% effectiveness of existing methods of treatment and prevention, and individual rehabilitation that has not been worked out.

For the treatment of children suffering from recurrent stenosing laryngotracheitis, bacterial lysates such as Bronchomunal and Ribomunil, which are stimulants of specific and nonspecific immunity, have been used. In complex therapy, bifiform was also used - a combined preparation, which includes natural bifidum bacteria and enterococci, fenspiride hydrochloride, which has an anti-inflammatory effect, retinol acetate or Triovit capsules containing vitamins C, E

and β-carotene, phenibut - a nootropic drug , which was prescribed to patients with significant disturbances in the bioelectrical activity of the brain. The technical result of the proposed method consists in choosing a therapy regimen depending on the degree of dysbiosis of the mucous membranes of the nasopharynx and oropharynx, followed by a complex effect on the microflora of the large intestine, airway hypersensitivity and impaired brain bioelectric activity in children. It was found that in children suffering from recurrent stenosing laryngotracheitis, there are significant disturbances in the composition of the microflora of the mucous membranes of the nasopharynx and oropharynx, characterized by the development of dysbiosis of I or II degree, associated disorders of the microbiocenosis of the digestive tract, forming chronic inflammation of the mucous membranes, contributing to the sensitization of the body, leading to violation of the function of external respiration and threshold sensitivity, bioelectrical activity of the brain, which causes a persistent course of the disease and justifies the need to include drugs and methods in the complex of therapy that allow correcting the identified changes.

Local use of hormonal preparations with the help of a nebulizer accelerates the relief of laryngeal stenosis in acute stenosing laryngotracheitis by 1.5-2 times, and reduces the time of recovery and stay of patients in bed. The nebulizer has an advantage over other types of inhalers, as it forms microparticles of a certain size and mass, facilitating their deposition at the level of the upper respiratory tract.

The proposed method of treatment by T.V. Medvedeva is simple in execution, available for any infectious diseases hospital equipped with simple inhalers, reduces the load of therapeutic effects on the child, as well as the load of the physiotherapy room [6]. Due to the antiviral, immunomodulating effect of leukinferon, a decrease in the frequency of recurrence of laryngeal stenosis in children, as well as the frequency of acute respiratory viral infections, is expected. A method for treating stenosing laryngotracheitis in children, including antibacterial, hormonal, desensitizing, antispasmodic, muco-, secretolytic, enzyme therapy and inhalation administration of a drug, characterized in that leukinferon is used as a drug for inhalation administration on the first day of treatment at a dose of 10,000 IU for interferon, diluted in 5 ml of 0.9% sodium chloride solution, from the second day - physiological sodium chloride solution, and inhalations are carried out three times a day for 10 minutes with an interval of 4 hours until the disappearance of clinical symptoms.

The developed method of extubation in patients with ASLT using drugs: sodium oxybutyrate, diphenhydramine, prednisolone and lasix, allows for effective antinociceptive protection of the trachea. In addition, the method of antinociceptive protection of the trachea during extubation helps to reduce the time of prolonged intubation by 3-5 days compared to traditional methods, and also reduces the number of post-intubation complications by 1.5-3 times.

The approach to choosing a complex of therapeutic and rehabilitation measures should be individual and determined by the nature of dysbiotic disorders on the mucous membranes of the upper respiratory tract and large intestine, the sensitivity of the respiratory

tract and the established changes in the bioelectric activity of the brain. Some investigators prescribed sedative therapy (valerian, relanium, 1-3% sodium bromide solution, pipolfen, sodium hydroxybutyrate, etc.) during ASLT in order to relieve psychomotor agitation.

For the successful treatment of stenosing laryngotracheitis, early hospitalization of patients in a specialized department for the management of patients with ASLT or in a somatic children's (infectious) department in the presence of an intensive care unit is mandatory. Patients with ASLT of the 3rd degree, as well as the 2nd degree, are subject to hospitalization in the intensive care unit if the course of the disease does not improve within 24-48 hours against the background of ongoing therapy adequate to the severity of the condition. The need for immunocorrective therapy in the complex treatment of acute and recurrent laryngotracheitis can be caused by the severity of immune and immunoregulatory disorders, as well as the characteristics of the adaptive immune response in children [7, 8, 9].

In the literature of recent years, there is more and more evidence that it is almost impossible to cope with the growth of infectious morbidity with the help of antibiotics, antiviral and other chemotherapeutic drugs alone [10, 11]. The above drugs suppress the reproduction of the pathogen, but its final elimination from the body is the result of the activity of immunity factors. Therefore, against the background of suppressed immunoreactivity, the action of antiviral, antibacterial agents will be ineffective or ineffective. In addition, immunotherapy is of particular importance due to the increase in antibiotic-resistant 3-lactamase-producing strains, the strengthening of the role of opportunistic microbial flora in the etiology of laryngitis in children.

In this regard, at present, the interest of researchers and practitioners in drugs that affect immunity, used in the complex treatment of various pathologies of both infectious and other genesis, has significantly increased. Immunotherapy is prescribed in combination with other drugs (antibiotics, NSAIDs). Its effectiveness depends on the correct assessment of the initial state of the patient's immunoreactivity, the nature and severity of pathological changes, the choice of the optimal drug and the scheme of its use. It is also necessary to have an idea about the mechanisms of action of prescribed drugs, their side effects, compatibility with other methods of treating laryngotracheitis, and allergenic properties.

Taking into account the pathogenetic features of acute and recurrent laryngotracheitis in children, one of the main problems of treatment should be considered the search for optimally effective and safe means of etiotropic, immunomodulatory therapy that is compliant for the child. According to the requirements, drugs used in the treatment of acute and recurrent viral infections in children of various localizations must combine the properties of an inhibitor of viral reproduction and an effective stimulator of the body's immune defense in order to eliminate the inertia of a specific antiviral immune response in children.

Among the whole variety of immunocorrectors, the most promising is the use of drugs from the class of recombinant interferons, in particular viferon, endogenous interferon inducers - drugs with a universally broad spectrum of action (arbidol), as well as drugs

belonging to the group of thymic factors (imunofan).

Viferon is a complex immunomodulatory and antiviral drug with a virocidal effect, as well as the ability to modulate and enhance antiviral resistance. The composition of Viferon includes membrane-stabilizing components (vitamin E and ascorbic acid), the combination with which causes an increase in the antiviral activity of recombinant interferon, an increase in its immunomodulatory effect on T- and B-lymphocytes. When exposed to exogenous interferon in the body, the activity of natural killers, T-helpers, cytotoxic T-lymphocytes, phagocytic activity, and the intensity of differentiation of B-lymphocytes increase.

The listed properties of interferon allow it to effectively participate in the processes of pathogen elimination, prevention of infection and possible complications. Viferon is quite widely used for the treatment of uncomplicated forms of respiratory viral infections, however, the effectiveness of its use in acute and recurrent laryngo-racheitis has not been evaluated. At the same time, given the disturbances in the interferon status that occur in acute, and especially in recurrent laryngitis / laryngotracheitis, we assume that this drug will be quite effective in the treatment of children with this pathology.

Imunofan is a drug with immunostimulating, detoxifying, hepatoprotective and antioxidant effects.Its action is based on the enhancement of phagocytosis reactions and the death of intracellular bacteria and viruses, as well as the restoration of disturbed indicators of cellular and humoral immunity, by enhancing the proliferation of T-lymphocytes, increasing the production of interleukin-2, TNF-α, IFN-γ. As shown by the analysis of literature data, this drug has not been previously used in acute and recurrent laryngotracheitis. However, in our opinion, the range of immunocorrective action of imunofan suggests the effectiveness of its use in the complex therapy of acute respiratory infections, in general, and in laryngotracheitis in particular.

Recently, Arbidol has been widely used for the treatment and prevention of respiratory viral infections. Since this drug, in addition to virus-specific and antioxidant, also has immunomodulatory and interferon-inducing effects, it seems interesting to compare the effectiveness of arbidol in LT in children with the effectiveness of the above drugs. Arbidol is a synthetic antiviral drug that can also stimulate the synthesis of endogenous interferon, activate phagocytosis and affect the state of the T-cell immunity. The mechanism of its antiviral action is associated with the inhibition of the translation of virus-specific proteins in infected cells, as a result of which the reproduction of viruses is suppressed. It has been established that arbidol specifically inhibits influenza A and B viruses and increases the body's resistance to other respiratory viruses. Arbidol refers to low-toxic drugs. When administered orally in recommended doses, it does not have any negative effect on the child's body. The use of arbidol in ARVI is widespread, but the effectiveness of its use for the treatment of acute and recurrent laryngotracheitis has not been evaluated.

Cytokines are the main mediators of local inflammation and acute phase response at the body level. Changes in the state of the immune system of children with ASLT, as well as the possibility of regulating these disorders with the help of cytokines, provide a

basis for searching for immunological approaches to the treatment of this disease.Currently, to correct the identified disorders in ASLT in children, monopreparations of cytokines of both natural (human leukocyte interferon) and genetically engineered origin (reaferon) have been used, the use of which contributes to the relief of symptoms of the disease at an earlier time.

At the same time, it is of interest to study the role of complex preparations of cytokines in the treatment of ASLT in children, given the variety of immunological disorders in this disease. Leukinferon is one of the complex drugs. The clinical efficacy of leukinferon in children for the immunocorrection of diseases of the bronchopulmonary system, as well as viral infections (caused by the herpes virus, hepatitis B, C, D viruses, etc.) has been shown. In these cases, the immunomodulatory effect of the drug is combined with its antiviral effect. Due to the biological characteristics of cytokines (short half-life, etc.), in order to achieve the greatest clinical effect of the drug, it is optimal to create a high local concentration in the area of inflammation. A similar effect can be achieved with the inhalation of leukinferon.

The inhalation use of cytokines (leukinferon) in the complex therapy of ASLT is recommended as an effective, safe and easily performed method of treating children with grade 1-2 laryngeal stenosis, which allows to reduce the amount of therapeutic burden on patients and reduce their length of stay in the hospital. In addition, the study of cytokine, in particular interferon, status is fundamentally important for clarifying the most important pathogenetic mechanisms of the development of this pathology in childhood, which is not only an important criterion in prescribing adequate individual anti-inflammatory and immunocorrective therapy, but also, possibly , will allow to individualize the prognosis of the disease. This will contribute to a differentiated approach to the choice of the method of rehabilitation and anti-relapse treatment, as well as to single out children from the risk group for the occurrence of ASLT relapses in the future [8].

Thus, ASLT in children currently remains a serious public health problem due to their wide prevalence, the economic damage they cause to society as a whole and to individuals in particular. Attention is drawn to the increase in the frequency of recurrence of laryngotracheitis, which contributes to the formation of chronic pathology of the respiratory organs, can lead to a delay in the physical and psychomotor development of children, adversely affect the formation of the child's immune system, and lead to the development of secondary immunosuppression.

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