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ROLE OF PROBIOTICS IN THE TREATMENT OF RECURRENT TONSILLOFARINGITIS PATIENTS (REVIEW)

Annotation: *Clinical studies, the results of which confirm the efficacy and safety of Streptococcussalivarius K12 in paediatric population in case of recurrent streptococcal upper respiratory tract infections, are considered. The importance of Streptococcussalivarius K12 administration after antibiotic therapy is emphasised to restore the natural microbiocenosis of the oral cavity, nasopharynx and to reduce antibiotic resistance.*

Keywords: *Streptococcussalivarius K12; recurrent tonsillopharyngitis; bacterial complications*

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The relevance of the problem of treatment of recurrent tonsillopharyngitis remains at a fairly high level due to the high prevalence of this nosology. In the adult population, recurrent tonsillopharyngitis is diagnosed in 5-6 to 37%, and in children - from 15 to 63% [1]. It should be taken into account that these figures may be underestimated due to the fact that recurrent tonsillopharyngitis in its compensated form is often detected only during a preventive examination or during an examination when the patient is referred for another disease. Recurrent tonsillopharyngitis is associated with sore throat in 6 to 8% of paediatricians and general practitioners.

In addition, the large number of complications of recurrent tonsillopharyngitis with hetero- and autoimmune pathogenesis, such as acute rheumatic fever, arthritis, vasculitis, glomerulonephritis, etc., adds to the importance of the problem. Tonsillopharyngitis can be due to both non-infectious and infectious causes. In paediatric practice, most cases of upper respiratory tract infections are of viral origin, especially in the early childhood and preschool age groups. The bacterial nature of the disease can be distinguished from the viral one by culture and rapid test for β-haemolytic group A streptococcus or Streptococcuspyogenes.

According to epidemiological studies, acute respiratory viral infections (ARVI) are the most common pathology among children [2]. This group accounts for 60-90% of all registered paediatric infectious pathology [3], 40-60% or more of outpatient visits and 20-30% of hospitalisations [4]. Even in non-epidemic periods, the incidence of acute respiratory infections is many times higher than for all other infectious diseases. At least 30% of the world's population is involved in the epidemic process during the corresponding period, with 60-70% of them being children [5].

According to modern studies, there is a close relationship between the state of microbiocenosis of the upper respiratory tract and the development of bacterial complications of the ENT organs during acute respiratory viral infections. In norm in the oral cavity and nasopharynx constantly inhabit Neisseria, diphtheroids, alpha-haemolytic and gamma haemolytic streptococci, enterococci, mycoplasmas, coagulase-negative staphylococci, moraxellae, bacteroids, borrelia, pneumococci, haemolytic bacillus, actinomycetes. Their normal ratio prevents the settlement of the upper respiratory tract by pathogenic microorganisms and multiplication of opportunistic flora [5].

Under the influence of acute respiratory infections and other factors that suppress the function of ciliary epithelium and immune defence, non-invasive multiplication of Streptococcuspneumoniae, Streptococcuspyogenes, Haemophilusinfluenzae occurs in the nasal cavity, pharynx, tonsils with the development of bacterial process in usually sterile parts of the respiratory tract in the middle ear, paranasal sinuses and lacunae of tonsils [5-7].

Depending on the etiology of respiratory disease, the presence of bacterial complications and their severity, the approach to therapy should be different.Uncomplicated course and non-infectious etiology of the disease in most cases do not require the prescription of antibacterial drugs.However, the increasing resistance of microflora to a wide range of antibiotics and the possibility of a catastrophic course of bacterial or viral infection in immunocompromised patients determines the need to search for new effective means, which are considered as an alternative to antibiotics. To combat these negative phenomena, new effective agents have been developed that are currently considered as an alternative to antibiotics: lantibiotics. Their use is also necessary to restore the natural microflora of the oropharynx after antibiotic therapy and to prevent complications of acute respiratory infections.

Lantibiotics- are a class of peptide antibiotics synthesised by Gram-positive bacteria (Streptococcus, Streptomyces) against other Gram-positive bacteria –*Streptococcus pyogenes, Streptococcus pneumoniae,* some Gram-negative bacteria –*Haemophilus influenzae*and *Moraxella catarrhalis,* as well as fungi of the genus *Candida*. In upper respiratory tract diseases they are one of the alternatives to antibacterial drugs.Streptococcus salivarius K12 (SsK12; Bacteriocin-Like Inhibitory Substances K12 - BLISK12) is a representative of this group of drugs.

Streptococcus salivarius K12 is known to act by colonising the oral cavity and nasopharynx, i.e. it is a respiratory probiotic. Streptococcus salivarius K12 actively inhibits the growth of *Streptococcus pyogenes, Streptococcus pneumoniae, Haemophilus influenzae* and *Moraxella catarrhalis,* which are among the main etiological factors of bacterial infections of the respiratory tract in children.S. Salivarius K12 competes with pathogenic microflora for nutrient media and promotes its displacement. Moreover, this effect persists for a month after the last dose of the drug. In addition, S. salivarius K12 synthesises salivaricins, which are natural antibacterial substances. Its administration in acute respiratory viral infections prevents the development of bacterial complications. In recurrent infections Streptococcussalivarius K12 reduces respiratory morbidity, the need for antibacterial drugs and improves the microbiocenosis in the oral cavity and nasopharynx.

In chronic recurrent infections, the administration of Bactoblis® leads to a significant reduction in episodes of both streptococcal and viral infections, and reduces the number of days of antibacterial and antipyretic therapy [12].Streptococcus salivariusK12 has proven efficacy and safety in the treatment and prevention of acute respiratory infections and its complications.The K12 strain is effective not only against S. pyogenes, but also inhibits the growth of such pathogens as Haemophilusinfluenzae, S. pneumoniae and Moraxellacatarrhalis, which are involved in the etiopathogenesis of acute otitis media. These four pathogens are responsible for almost all cases of bacterial pharyngotonsillitis in children and adults.

Results of K12 use in children show that the strain can colonise the oral cavity in approximately 30% of children as early as the third day of administration, with clear colonisation even in the nasopharynx and adenoids, and can remain in tissues for up to 32 days after the last administration. The K12 strain also has an excellent antibiotic sensitivity profile and high safety profile, as demonstrated in animal and human trials.Recent clinical trials in both adults and children have shown that treatment with the K12 strain reduces recurrences of bacterial pharyngotonsillitis by approximately 80% and 90%, respectively. Even if treatment is followed by a 6-month washout period of at least 90 days, the level of protection against recurrence remains high (about 60% in all cases). The reduction in the use of antibiotics and antipyretics by more than 80% and the significant reduction in the number of missed days in preschool and school by 81 and 77%, respectively, should be emphasised.

Therefore, given the good compliance and tolerability of Bactoblis® and the need for long-term use to maximise the therapeutic effect, many authors recommend repeated courses of Streptococcus salivariusK12 2-3 times a year.

A respiratory probiotic is not necessary to restore the natural protective microflora of the oral cavity and nasopharynx after antibiotic therapy by colonising the oral cavity and nasopharynx with Streptococcus salivariusK12. This increases the resistance of the child's organism to reinfection, reduces the recovery period after viral and bacterial infections, prevents the development of antibiotic resistance. Its use is advisable when adapting a child to the team, when changing climatic conditions. The constant presence of Streptococcussalivarius K12 in the oral cavity and nasopharynx prevents diseases of the upper respiratory tract.

Conclusion. When all recommendations are followed, StreptococcussalivariusK12 has a high safety profile, good tolerability, hypoallergenicity and may be particularly useful in patients who would otherwise be forced to undergo frequent cycles of antibiotic therapy. We hope that further research into this new approach to infection prevention, also in view of the ever-increasing need to reduce antibiotic use in patients of all ages to reduce the risk of developing antibiotic resistance.

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