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PERSPECTIVES ON THE USE OF PROBIOTICS FOR THE INTRANASAL TREATMENT OF RHINITIS

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Probiotics for intranasal administration represent a promising approach for the prevention and treatment of rhinitis. They can form a protective biofilm in which beneficial microorganisms compete with pathogens, produce antimicrobial metabolites, and modulate the local immune response. This contributes to the restoration of the mucous membrane and enhances the epithelial barrier function.

Potential benefits of intranasal probiotics include the ability to restore the microbial balance of the nasal environment. This helps reduce dryness of the nasal epithelium, crust formation, and ciliary adhesion, while increasing resistance to secondary bacterial or viral infections. Furthermore, probiotics promote the regeneration of the mucous membrane, especially after irritation, prolonged use of vasoconstrictor drops, or mucosal atrophy.

Scientific research focuses on several key strains. For instance, *Lactobacillus* strains, particularly *L. rhamnosus*, have been studied for their effects on allergic rhinitis (Jerzynska et al., 2016; Choi et al., 2018; Jalali et al., 2019). The results indicate that their use can modulate the immune response and improve mucosal barrier function. Cho et al. (2020) investigated the *Lactobacillus sakei* strain and found a notable correlation: in patients with chronic rhinosinusitis (CRS), the level of *L. sakei* is often significantly reduced, whereas it is present in healthy individuals. Moreover, *L. sakei* has demonstrated the ability to inhibit the growth of *Staphylococcus aureus*, a key pathogen in CRS, *in vitro*.

Di Pierro et al. (2012) found that *Streptococcus salivarius* K12 produces salivaricins, which can inhibit pathogens causing pharyngitis and otitis. By colonizing the nasopharynx, this strain creates a protective barrier that helps prevent the spread of infection to the sinuses.

Currently, the Ukrainian pharmaceutical market offers the registered nasal probiotic gel Zonet, which contains live *Bacillus spp.* bacteria (>5×10^7 CFU/ml) and auxiliary moisturizing components. This demonstrates that the concept of nasal probiotics is gradually transitioning from experimental models to practical application.

Although evidence for the efficacy of intranasal probiotics is still limited, studies show changes in microbiota and inflammatory markers, the clinical effect is not always pronounced. Nevertheless, the use of probiotics in allergic and non-allergic rhinitis is considered promising. In cases of impaired mucosal barrier function and dysbiosis, they can help restore microbial balance and reduce inflammation. In chronic rhinosinusitis, probiotics may potentially complement standard therapy, particularly in combating bacterial biofilms. Currently, it is advisable to consider them as an adjunctive treatment method.