EFFECTIVENESS OF PROBIOTIC THERAPY IN THE MANAGEMENT OF ALLERGIC STOMATITIS IN CHILDREN

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Abstract. *Allergic stomatitis in children is an immune-mediated inflammation of the oral mucosa often associated with systemic atopy and impaired local defense. Probiotics may help by modulating the oral and intestinal microbiome, enhancing antimicrobial factors in saliva, and restoring mucosal immune balance.*

Aim. *To evaluate the clinical, microbiological, and immunological effectiveness of probiotic therapy in children with allergic stomatitis.*

Methods. *A randomized controlled trial was conducted involving 60 children aged 3–10 years, divided into two groups: Group I (n = 30): standard anti-allergic therapy + probiotic (*Lactobacillus rhamnosus *GG, 1 × 10^9 CFU daily for 4 weeks). Group II (n = 30): standard therapy only. Clinical symptoms were evaluated before and after treatment. Salivary secretory IgA, lysozyme, lactoferrin, and salivary pH were measured (ELISA and potentiometry). Oral microbiota composition was assessed by culturing* Lactobacillus *and* Streptococcus *spp. colonies.*

Results: *Children receiving probiotics showed a significant increase in salivary sIgA, lysozyme, and lactoferrin levels, normalization of salivary pH, and restoration of microbial balance—an increase in* Lactobacillus *and a reduction in pathogenic* Streptococcus *(p < 0.01). Clinically, the duration and recurrence of lesions were reduced by about 40%.*

Conclusion. *Probiotic therapy improves oral microbiota composition and strengthens mucosal immunity in children with allergic stomatitis, representing a promising adjunctive strategy for its management.*

Keywords: *Allergic stomatitis; probiotics; children;* Lactobacillus rhamnosus *GG; secretory IgA; lysozyme; lactoferrin; oral microbiota; mucosal immunity; salivary pH.*

Introduction. Allergic stomatitis represents a localized manifestation of systemic allergic disease, characterized by erythema, edema, and erosive lesions of the oral mucosa, mediated by both immediate (IgE-dependent) and delayed (cell-mediated) hypersensitivity reactions. The oral microbiome plays a key role in maintaining mucosal homeostasis and immune regulation. Microbial dysbiosis—an imbalance in microbial composition—can lead to reduced colonization by beneficial *Lactobacillus* and *Bifidobacterium* species, and an overgrowth of opportunistic organisms such as *Streptococcus mutans* or *Neisseria*, contributing to mucosal inflammation [1, 2]. Probiotics, defined as live microorganisms that confer health benefits to the host, have been shown to modulate both gut and oral microbiota, enhance antimicrobial components of saliva (lysozyme, lactoferrin), and stimulate the production of secretory IgA [3, 4, 8]. However, their therapeutic potential in pediatric allergic stomatitis remains insufficiently investigated.

Objective: To assess the clinical effects, microbiota modulation, and mucosal immune changes following probiotic therapy in children with allergic stomatitis.

Materials and Methods. Randomized controlled clinical trial was completed at Republican Specialized Scientific and Practical Center of Allergology and Clinical Immunology with 60 children aged 3–10 years with a confirmed diagnosis of allergic stomatitis. Exclusion criteria was antibiotic use within the previous month, systemic autoimmune disorders, or oral candidiasis. Group I: standard anti-allergic therapy (antihistamine + topical anti-inflammatory) + probiotic (*L. rhamnosus* GG, 1 × 10^9 CFU/day for 4 weeks). Group II**:**

standard anti-allergic therapy only. Number of lesions, erythema intensity, pain score (VAS 0–10), and healing time were recorded at baseline and after 4 weeks.

Laboratory and microbiological tests were secretory IgA, lysozyme, and lactoferrin measured by ELISA; pH measured potentiometrically. Oral swabs cultured on selective media to quantify *Lactobacillus* and *Streptococcus* spp. (CFU/ml). Statistical analysis was detected in SPSS v.26.0; Mann–Whitney U test, paired t-test, Pearson correlation; $p < 0.05$ considered significant.

Results. Children receiving the probiotic (Group I) showed faster lesion healing (mean 3.2 ± 1.1 days vs 5.4 ± 1.3 days; $p < 0.01$). Recurrence within one month was lower (13% vs 37%). Pain and erythema scores decreased significantly, and no adverse effects were reported.

Parameter	Group I (Probiotic therapy)	Group II (Control)	Statistical significance (p-value)
sIgA	↑ 40 %	↑ 9 %	< 0.01
Lysozyme	↑ 35 %	↑ 8 %	< 0.01
Lactoferrin	↑ 32 %	↑ 6 %	< 0.01
Salivary pH (mean)	6.9 → 7.2	6.8 → 6.9	< 0.05
Lactobacillus (CFU/ml)	↑ 48 %	↑ 11 %	< 0.01
Streptococcus (CFU/ml)	↓ 37 %	↓ 10 %	< 0.01

A positive correlation was found between *Lactobacillus* count and salivary sIgA ($r = 0.58$, $p < 0.01$). Higher lysozyme and lactoferrin levels were associated with faster clinical recovery.

Discussion. This study demonstrates that probiotic therapy significantly improves clinical outcomes, restores oral microbial balance, and strengthens mucosal immunity in children with allergic stomatitis. Increased sIgA, lysozyme, and lactoferrin levels indicate enhanced mucosal defense, while normalization of salivary pH reflects improved oral environment stability. The rise in *Lactobacillus* and reduction in pathogenic *Streptococcus* suggest that *L. rhamnosus* GG supports microbiome restoration and reduces inflammatory activity. Similar effects were reported in previous studies showing decreased *Streptococcus mutans* counts in children [5,7] and microbiome shifts in adults receiving *L. rhamnosus* GG [6]. Small sample size, short follow-up (4 weeks), and use of culture-based rather than sequencing-based microbiota analysis. Future studies should include multi-strain probiotics, longer treatment, and metagenomic profiling to clarify mechanisms.

Conclusion. Probiotic therapy with *Lactobacillus rhamnosus* GG significantly improves clinical symptoms, modulates oral microbiota, and enhances mucosal immunity in children with allergic stomatitis. It represents a safe and effective adjunct to standard anti-allergic treatment, strengthening mucosal defense and reducing recurrence risk.

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