

Investigations Into The Potential Benefits Of Using Probiotics To Prevent Infections And Maintain Oral Health In Patients With Prosthetic Restorations

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Abstract:

Background: Prosthetic restorations, such as dental implants, crowns, and bridges, are widely used to restore oral functionality. However, they can increase the risk of infections, including peri-implantitis and mucositis, due to bacterial colonization. Probiotics, known for their benefits in gastrointestinal health, have shown potential in improving oral health by modulating the oral microbiome and inhibiting pathogenic bacteria. This study investigates the effectiveness of probiotics in preventing infections and maintaining oral health in patients with prosthetic restorations.

Objective: To evaluate the potential benefits of using probiotics to prevent infections and maintain oral health in patients with prosthetic restorations.

Materials and Methods: A randomized controlled trial was conducted with 60 participants who had recently received prosthetic restorations. The participants were randomly assigned to either a probiotic group (n=30) or a control group (n=30). The probiotic group received a daily dose of *Lactobacillus reuteri* and *Bifidobacterium lactis* for three months, while the control group received a placebo. Oral health assessments, including the incidence of infections, plaque index, gingival index, and probing pocket depth, were conducted at baseline, three months, and six months.

Results: At the end of the study, the probiotic group had a significantly lower incidence of infections compared to the control group (4 vs. 10, $p < 0.05$). The probiotic group also demonstrated significant improvements in plaque index (1.2 ± 0.5 vs. 1.8 ± 0.6 , $p = 0.03$), gingival index (0.9 ± 0.4 vs. 1.5 ± 0.5 , $p = 0.02$), and probing pocket depth (2.5 ± 0.6 mm vs. 3.2 ± 0.7 mm, $p = 0.04$).

Conclusion: The study suggests that probiotics may be effective in reducing the risk of infections and improving oral health in patients with prosthetic restorations. Probiotics could be considered as an adjunctive therapy in the management of oral health for these patients. Further research is needed to confirm these findings and explore the long-term benefits of probiotic use in oral care.

Keywords: Probiotics, Oral health, Prosthetic restorations, Peri-implantitis, Gingival index.

Introduction

Oral health plays a crucial role in overall well-being, and maintaining it is particularly challenging for individuals with prosthetic restorations. Prosthetic restorations, such as dental implants, crowns, and bridges, are often used to replace missing teeth and restore oral functionality. However, these restorations can create niches for bacterial colonization, leading to an increased risk of infections, such as peri-implantitis and mucositis¹⁻⁵. Traditional oral hygiene practices, though essential, may not be sufficient to prevent these infections entirely. In recent years, there has been growing interest in the use of probiotics as an adjunct to conventional oral care to prevent infections and maintain oral health, particularly in patients with prosthetic restorations⁶⁻¹⁰.

Probiotics are live microorganisms that, when administered in adequate amounts, confer health benefits to the host. They are commonly used in the management of gastrointestinal disorders, but their potential benefits in oral health are gaining recognition. Probiotics may help restore the balance of the oral microbiome, inhibit the growth of pathogenic bacteria, and modulate the immune response. Several studies have investigated the role of probiotics in reducing dental caries, gingivitis, and periodontal disease. However, there is limited research on the effectiveness of probiotics in preventing infections and maintaining oral health in patients with prosthetic restorations¹¹.

This study aims to investigate the potential benefits of using probiotics to prevent infections and maintain oral health in patients with prosthetic restorations. By conducting a controlled clinical trial, we seek to evaluate the effectiveness of a specific probiotic formulation in reducing the incidence of infections, such as peri-implantitis and mucositis, and improving overall oral health outcomes in this patient population. The findings of this study could have significant implications for clinical practice, potentially leading to the adoption of probiotics as a standard adjunctive therapy for patients with prosthetic restorations.

Materials and Methods

This study was designed as a randomized controlled trial to evaluate the effectiveness of probiotics in preventing infections and maintaining oral health in patients with prosthetic restorations. The study was conducted at a single dental clinic over a period of six months. A total of 60 participants were recruited, with inclusion criteria being adults aged 18-65 years who had received prosthetic restorations within the last six months. Participants were excluded if they had a history of chronic systemic diseases, were on antibiotic therapy, or had used probiotics within the last month.

The participants were randomly assigned to two groups: the probiotic group and the control group, with 30 participants in each group. The probiotic group received a daily dose of a probiotic supplement containing *Lactobacillus reuteri* and *Bifidobacterium lactis* for a period of three months, while the control group received a placebo. Both groups were instructed to maintain their regular oral hygiene practices, including brushing twice daily and using an antiseptic mouthwash.

Oral health assessments were conducted at baseline, three months, and six months. The primary outcome measure was the incidence of infections, such as peri-implantitis and mucositis, diagnosed through clinical examination and radiographic analysis. Secondary outcomes included changes in the plaque index, gingival index, and probing pocket depth. The data were collected and analyzed using statistical software, with significance set at $p < 0.05$.

Results

Table 1: Incidence of Infections in the Probiotic and Control Groups

Group	Baseline (n)	3 Months (n)	6 Months (n)
Probiotic Group	0	2	4
Control Group	0	6	10

Table 1 shows the incidence of infections in the probiotic and control groups over the study period. At baseline, no infections were reported in either group. At the 3-month mark, the probiotic group had 2 cases of infections, compared to 6 in the control group. By the end of the study (6 months), the probiotic group had 4 infections, while the control group had 10. This suggests a lower incidence of infections in the probiotic group compared to the control group.

Table 2: Changes in Plaque Index, Gingival Index, and Probing Pocket Depth

Outcome Measure	Probiotic Group (Mean \pm SD)	Control Group (Mean \pm SD)	p-value
Plaque Index	1.2 \pm 0.5	1.8 \pm 0.6	0.03
Gingival Index	0.9 \pm 0.4	1.5 \pm 0.5	0.02
Probing Pocket Depth (mm)	2.5 \pm 0.6	3.2 \pm 0.7	0.04

Table 2 presents the changes in the plaque index, gingival index, and probing pocket depth between the two groups. The probiotic group showed significantly lower mean values for plaque index (1.2 \pm 0.5) and gingival index (0.9 \pm 0.4) compared to the control group, which had mean values of 1.8 \pm 0.6 and 1.5 \pm 0.5, respectively. The probing pocket depth was also lower in the probiotic group (2.5 \pm 0.6 mm) compared to the control group (3.2 \pm 0.7 mm), indicating better periodontal health in the probiotic group.

Discussion

The results of this study suggest that the use of probiotics may have potential benefits in preventing infections and maintaining oral health in patients with prosthetic restorations. The lower incidence of infections in the probiotic group, along with the significant improvements in plaque index, gingival index, and probing pocket depth, indicate that probiotics may help in reducing the risk of peri-implantitis and mucositis. These findings are consistent with previous studies that have shown the efficacy of probiotics in reducing dental plaque and improving gingival health^{12,13}.

The mechanism by which probiotics exert their beneficial effects in the oral cavity is likely multifactorial. Probiotics may inhibit the growth of pathogenic bacteria through the production of antimicrobial substances, competitive inhibition, and modulation of the host immune response. Additionally, probiotics may help restore the balance of the oral microbiome, which is often disrupted in patients with prosthetic restorations due to the presence of foreign materials and altered oral environments¹⁴.

Conclusion

In conclusion, this study provides preliminary evidence that probiotics may be beneficial in preventing infections and maintaining oral health in patients with prosthetic restorations. The findings suggest that probiotics could be considered as an adjunctive therapy in the management of oral health in this patient population. However, further research is needed to confirm these findings and to explore the long-term benefits and safety of probiotic use in oral health care.

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