

**How to Cite:**

Arora, V., Jitender, J., Singh, R., & Gandhi, K. (2022). Assessment of effect of probiotics to nonsurgical treatment of chronic periodontitis. *International Journal of Health Sciences*, 6(S1), 9322–9328. <https://doi.org/10.53730/ijhs.v6nS1.7113>

## **Assessment of effect of probiotics to nonsurgical treatment of chronic periodontitis**

**Dr. Varun Arora**

MDS Periodontics & Implantology, Practising dentist at Asian Dental Care, Aggarsen Chowk Kurukshetra, Haryana

Email: [varunarora19852002@gmail.com](mailto:varunarora19852002@gmail.com)

**Dr. Jitender**

Oral and maxillofacial surgeon, Senior resident in Kalpana Chawla Medical College and Hospital, Karnal, Haryana

Email: [jitu692@gmail.com](mailto:jitu692@gmail.com)

**Dr. Roohi Singh**

BDS, Panjab University, Chandigarh, India

Corresponding author Email: [roohisingh26@gmail.com](mailto:roohisingh26@gmail.com)

**Dr. Kanica Gandhi**

PG student Department of Prosthodontics, Crown Bridge Implantology at MM College Of Dental Sciences & Research, MMU, Mullana, Haryana

Email: [gandhikanica@gmail.com](mailto:gandhikanica@gmail.com)

**Abstract**--Background: Periodontal disease represents an inflammation of both soft and hard tooth-supporting tissues which is regarded as one of the major causes of tooth loss worldwide. The present study was conducted to assess effect of probiotics to nonsurgical treatment of chronic periodontitis. Materials & Methods: 48 patients of chronic periodontitis of both genders was included. In all patients, bacterial cultures and clinical evaluation were recorded in 70 sites in patients. After scaling and root planning (SRP), oral hygiene measures were reassured, and sites were divided into 2 groups 35 sites each. Group I received SRP only and group II received SRP and subgingival delivery of 1 ml of probiotic *L*. Results: Out of 48 patients, males were 23 and females were 25. The mean plaque index showed score 3 at baseline was seen in 35 in group I and 35 in group II. At 3 months score 1 was seen in 17 in group I and 35 in group II, score 2 in 18 in group I. At 6 months, score 2 was seen in 17 in group I and 25 in group II and score 3 in 18 in group I. and 10 in group II. The mean bleeding on probing score was negative seen in none and positive in 35 each in group I and II, at 3 months was negative in 10 in group I and 35 in group II and positive in 25 in group I. At 6

months, negative in 20 in group II and positive in 35 in group I and 15 in group II. The mean pocket depth at baseline in group I was 5.34 and in group II was 5.11, at 3 months was 3.54 and 2.92 and at 6 months was 4.35 and 3.34 in group I and II respectively. CAL at baseline was 3.32 and 3.11, at 3 months was 1.52 and 0.93 and at 6 months was 2.31 and 1.30 in group I and II respectively. The difference was significant ( $P < 0.05$ ). Conclusion: Local application of *L. reuteri* in addition with SRP gives superior results than SRP alone in cases with chronic periodontitis.

**Keywords**---Scaling and root planning, *L. reuteri*, Chronic periodontitis.

## Introduction

Periodontal disease represents an inflammation of both soft and hard tooth-supporting tissues which is regarded as one of the major causes of tooth loss worldwide.<sup>1</sup> It originates from an untreated gingivitis, a reversible process linked to bacterial plaque accumulation, clinically characterized by an inflammation of the marginal gum with bleeding on probing.<sup>2</sup> In case this process is not reversed, it may lead to periodontitis, presenting irreversible periodontal attachment loss, pockets, recessions, and eventually tooth mobility and even loss.<sup>3</sup>

Probiotics are living microorganisms which, when administered in adequate amounts, confer a health benefit for the host. However, there is in vitro and animal evidence that probiotic preparations comprised of dead cells and their metabolites can also exert a biological response.<sup>4</sup> Probiotics' exact mechanism of action in the oral cavity isn't fully understood: there may be a direct interaction with the dental plaque, disrupting the biofilm owing to their antimicrobial products and competitive adhesion, and an indirect action as well, modulating the host's immune response.<sup>5</sup>

*Lactobacillus reuteri* (*L. reuteri*) withdrew attention. Its modes of action include beneficial alteration of local ecology, antibiotic substance production, and host-immunity modulation. Many studies describe the ability of *Lactobacilli* to inhibit periodontal pathogen's growth. Several trials proved the synergistic effect of *L. reuteri* and SRP in CP treatment.<sup>6</sup> The present study was conducted to assess effect of probiotics to nonsurgical treatment of chronic periodontitis.

## Materials and Methods

The present study comprised of 48 patients of chronic periodontitis of both genders. The consent was obtained from all enrolled patients. Data such as name, age, gender etc. was recorded. In all patients, bacterial cultures and clinical evaluation were recorded in 70 sites in patients. After scaling and root planning (SRP), oral hygiene measures were reassured, and sites were divided into 2 groups 35 sites each. Group I received SRP only and group II received SRP and subgingival delivery of 1 ml of probiotic *L. reuteri* suspension at baseline and 1, 2, and 4 weeks using a blunt syringe. A periodontal pack was applied after the

placement of the drug. Parameters such as clinical attachment level, probing pocket depth, plaque index (PI), bleeding on probing, and microbiologically for *Porphyromonas gingivalis* (*P. gingivalis*) load was carried out at and followed up at 3 and 6 months. Data thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

## Results

Table I  
Distribution of patients

Total- 48		
Gender	Males	Females
Number	23	25

Table I shows that out of 48 patients, males were 23 and females were 25.

Table II  
Assessment of plaque index

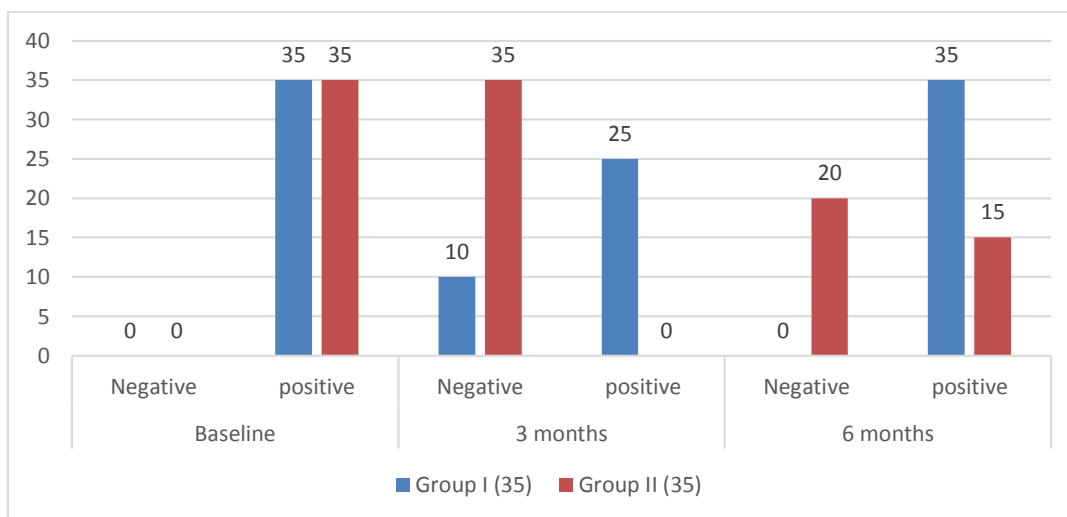
Plaque index	Variables	Group I (35)	Group II (35)	P value
Baseline	1	0	0	0.01
	2	0	0	
	3	35	35	
3 months	1	17	35	0.03
	2	18	0	
	3	0	0	
6 months	1	0	0	0.02
	2	17	25	
	3	18	10	

Table II shows that mean plaque index showed score 3 at baseline was seen in 35 in group I and 35 in group II. At 3 months score 1 was seen in 17 in group I and 35 in group II, score 2 in 18 in group I. At 6 months, score 2 was seen in 17 in group I and 25 in group II and score 3 in 18 in group I. and 10 in group II. The difference was significant ( $P < 0.05$ ).

Table III  
Assessment of bleeding on probing

BOP	Variables	Group I (35)	Group II (35)	P value
Baseline	Negative	0	0	0.02
	positive	35	35	
3 months	Negative	10	35	0.04
	positive	25	0	
6 months	Negative	0	20	0.05
	positive	35	15	

Table III, graph I shows that mean bleeding on probing score was negative seen in none and positive in 35 each in group I and II, at 3 months was negative in 10 in group I and 35 in group II and positive in 25 in group I. At 6 months, negative in 20 in group II and positive in 35 in group I and 15 in group II. The difference was significant ( $P < 0.05$ ).

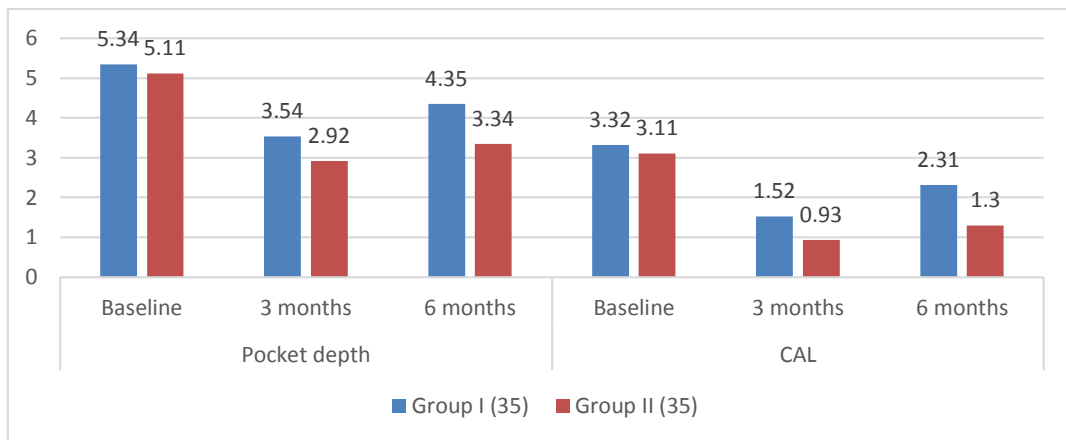


Graph I Assessment of bleeding on probing

Table IV  
Assessment of parameters

Parameters	Variables	Group I (35)	Group II (35)	P value
Pocket depth	Baseline	5.34	5.11	0.04
	3 months	3.54	2.92	
	6 months	4.35	3.34	
CAL	Baseline	3.32	3.11	0.05
	3 months	1.52	0.93	
	6 months	2.31	1.30	

Table IV, graph II shows that mean pocket depth at baseline in group I was 5.34 and in group II was 5.11, at 3 months was 3.54 and 2.92 and at 6 months was 4.35 and 3.34 in group I and II respectively. CAL at baseline was 3.32 and 3.11, at 3 months was 1.52 and 0.93 and at 6 months was 2.31 and 1.30 in group I and II respectively. The difference was significant ( $P < 0.05$ ).



Graph II Assessment of parameters

## Discussion

Periodontal treatment focuses on the removal of the bacterial deposits in order to reverse the inflammatory process.<sup>7</sup> Scaling and Root Planing (SRP) is the non-surgical gold standard procedure which is aimed at removing dental plaque/calculus as well as at smoothing root surfaces, respectively.<sup>8</sup> The most relevant flaw of SRP is the absence of a long-term effect due to an eventual bacterial recolonization after the therapy.<sup>9</sup> Accordingly, adjunctive treatments have been introduced in addition to SRP, e.g., the use of antibiotics, the photodynamic therapy, the administration of antioxidants, natural compounds, supplements (e.g., melatonin), and, in recent years, probiotic therapy.<sup>10</sup> The present study was conducted to assess effect of probiotics to nonsurgical treatment of chronic periodontitis.

We found that out of 48 patients, males were 23 and females were 25. The mean plaque index showed score 3 at baseline was seen in 35 in group I and 35 in group II. At 3 months score 1 was seen in 17 in group I and 35 in group II, score 2 in 18 in group I. At 6 months, score 2 was seen in 17 in group I and 25 in group II and score 3 in 18 in group I. and 10 in group II. El- Bagoori et al<sup>11</sup> assessed the benefit of locally delivered *Lactobacillus reuteri* (*L. reuteri*) probiotic as an adjunctive to scaling and root planing (SRP) in the treatment of chronic periodontitis clinically and microbiologically. Bacterial cultures and clinical evaluation were recorded in 20 sites of chronic periodontitis in 12 patients and followed up at 3 and 6 months from the start of intervention using clinical attachment level, probing pocket depth, plaque index (PI), bleeding on probing, and microbiologically for *Porphyromonas gingivalis* (*P. gingivalis*) load. Group I received SRP only, while Group II received SRP and subgingival delivery of 1 ml of probiotic *L. reuteri* suspension at baseline and 1, 2, and 4 weeks. Authors found noticeable variation between the two groups in all evaluation aspects at 3 and 6-month follow-up periods except PI at 6 months in which there was no significant difference between both groups.

We found that the mean bleeding on probing score was negative seen in none and positive in 35 each in group I and II, at 3 months was negative in 10 in group I and 35 in group II and positive in 25 in group I. At 6 months, negative in 20 in

group II and positive in 35 in group I and 15 in group II. Kulkarni et al<sup>12</sup> quantified *P. gingivalis* in CP cases and normal individuals by PCR and found a positive correlation between *P. gingivalis* and severity of the chronic sequel of periodontitis.

We found that the mean pocket depth at baseline in group I was 5.34 and in group II was 5.11, at 3 months was 3.54 and 2.92 and at 6 months was 4.35 and 3.34 in group I and II respectively. CAL at baseline was 3.32 and 3.11, at 3 months was 1.52 and 0.93 and at 6 months was 2.31 and 1.30 in group I and II respectively. Van Essche et al<sup>13</sup> proved that lactic acid inhibited the growth of other bacterial strains by producing a huge amount of organic acids.

### **Conclusion**

Authors found that local application of *L. reuteri* in addition with SRP gives superior results than SRP alone in cases with chronic periodontitis.

### **References**

1. Bassir SH, Alhareky M, Wangsrimongkol B, Jia Y, Karimbux N. WSystematic review and meta-analysis of hard tissue outcomes of alveolar ridge preservation. *Int J Oral Maxillofac Implants*. 2018;33:979-94.
2. Teughels W, Durukan A, Ozcelik O, Pauwels M, Quirynen M, Haytac MC. Clinical and microbiological effects of *Lactobacillus reuteri* probiotics in the treatment of chronic periodontitis: a randomized placebo-controlled study. *J Clin Periodontol*. 2013;40:1025-35.
3. Penala S, Kalakonda B, Pathakota KR, Jayakumar A, Koppolu P, Lakshmi BV, et al. Efficacy of local use of probiotics as an adjunct to scaling and root planing in chronic periodontitis and halitosis: a randomized controlled trial. *J Res Pharm Pract*. 2016;5:86-93.
4. Tekce M, Ince G, Gursoy H, Dirikan Ipci S, Cakar G, Kadir T, et al. Clinical and microbiological effects of probiotic lozenges in the treatment of chronic periodontitis: A 1-year follow-up study. *J Clin Periodontol*. 2015;42:363-72.
5. İnce G, Gürsoy H, İpçi ŞD, Cakar G, Emekli-Alturfan E, Yılmaz S. Clinical and biochemical evaluation of lozenges containing *Lactobacillus reuteri* as an adjunct to non-surgical periodontal therapy in chronic periodontitis. *J Periodontol*. 2015;86:746-54.
6. Iwasaki K, Maeda K, Hidaka K, Nemoto K, Hirose Y, Deguchi S. Daily intake of heat-killed *Lactobacillus plantarum* L-137 decreases the probing Depth in patients undergoing supportive periodontal therapy. *Oral Health Prev Dent*. 2016;14:207-14.
7. Morales A, Carvajal P, Silva N, Hernandez M, Godoy C, Rodriguez G, et al. Clinical effects of *Lactobacillus rhamnosus* in nonsurgical treatment of chronic periodontitis: a randomized placebocontrolled trial with 1-year follow-up. *J Periodontol*. 2016;87:944-52.
8. Hallström H, Lindgren S, Widén C, Renvert S, Twetman S. Probiotic supplements and debridement of peri-implant mucositis: a randomized controlled trial. *Acta Odontol Scand*. 2016;74:60-6.

9. Vivekananda MR, Vandana KL, Bhat KG. Effect of the probiotic *Lactobacilli reuteri* (Prodentis) in the management of periodontal disease: a preliminary randomized clinical trial. *J Oral Microbiol.* 2010;2.
10. El-Bagoory GK, El-Guindy HM, Shoukheba MY, El-Zamarany EA. The adjunctive effect of probiotics to nonsurgical treatment of chronic periodontitis: A randomized controlled clinical trial. *Journal of Indian Society of Periodontology.* 2021 Nov;25(6):525.
11. Kulkarni PG, Gosavi S, Haricharan PB, Malgikar S, Mudrakola DP, Turagam N, et al. Molecular detection of *Porphyromonas gingivalis* in chronic periodontitis patients. *J Contemp Dent Pract.* 2018;19:992–6.
12. Van Essche M, Loozen G, Godts C, Boon N, Pauwels M, Quirynen M, et al. Bacterial antagonism against periodontopathogens. *J Periodontol.* 2013;84:801–11.