WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 15, 802-809. Research Article ISSN 2277– 7105

EVALUATING THE EFFICACY OF LOCAL USE OF PROBIOTICS AS AN ADJUNCT TO SCALING AND ROOT PLANNING IN PATIENTS WITH CHRONIC PERIODONTITIS AND HALITOSIS – A RANDOMIZED CONTROL CLINICALTRIAL

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Article Received on
05 Sept. 2022,

Revised on 26 Sept. 2022,
Accepted on 17 October 2022

DOI: 10.20959/wjpr202215-25935

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ABSTRACT

Introduction: Periodontitis is a multifactorial disease. The etiological factor encompasses microbial colonization with or without invasion. Conventional periodontal treatment includes surgical and non-surgical management often accompanied with antibiotics. These treatment options are aimed at eliminating entire oral microflora irrespective of their pathogenicity and leaves an interrogation to the systemic conditions. As the microorganism shows increased resistance to antibiotics, the development of probiotics in the treatment of periodontal diseases has been a benison, that inturn increases the beneficial bacteria. Probiotics gives a natural and promising choice of therapy to establish both good oral and systemic health. Hence the objective of this study is to evaluate the clinical efficacy of Scaling and root planning(SRP) with probiotics as an adjuvant therapy in patients with chronic periodontitis and halitosis. **Materials and Methods:** A Randomized control trial was formulated on 30 systematically healthy individuals with chronic periodontitis with probing depth ≥5mm and halitosis. Two trials were included, Group A & B with 15 participants each. In Group A: A Probiotic mouthrinse (PERFORA thyme mouthrinse) was given after scaling and subgingival local drug delivery of probiotic solution was given after root planing. In Group B; Placebo mouthrinse and subgingival drug delivery of placebo were administered after scaling and root planning respectively. Gingival index [GI], Plaque index [PI], BANA test and probing depth were checked at baseline and after 6 weeks. **Result:** Result shows significant reduction in the

probing depths, GI & PI after treatment in probiotic local drug delivery group. All data were statistically analyzed using SPSS-20 Software with Student paired 't' test applied between the two groups. **Conclusion:** Use of probiotics as an adjuvant to scaling and root planing is very effective, convenient to use with lesser side effects when compared to conventional methods. Periodontal diseases are associated with systemic conditions and the emerging development of probiotics in the fascinating field of dentistry is setting a horizon as an assuring choice of therapy in treating oral as well as systemic diseases.

KEYWORDS: Chronic periodontitis, N-benzoyl-DL-arginine, Malodour, Probiotics.

INTRODUCTION

Chronic Periodontitis is the most prevalent form of periodontitis, generally considered to be a slowly progressive disease characterized by clinical attachment loss and alveolar bone loss. The presence of pathogenic bacteria, the absence of "beneficial bacteria", and the susceptibility of the host are the main etiological factors of periodontal diseases.[2] Halitosis is a general term used to describe a foul odour emanating from the oral cavity, in which proteolysis, metabolic products of the desquamating cells, and bacterial purifications are involved.[1] Conventional periodontal treatment includes surgical and non-surgical management often accompanied with antibiotics. These treatment options are aimed at eliminating entire oral microflora irrespective of their pathogenicity and leaves an interrogation to the systemic conditions. As the microorganism shows increased resistance to antibiotics, the development of probiotics in the treatment of periodontal diseases has been a benison, that inturn increases the beneficial bacteria. Probiotics gives a natural and promising choice of therapy to establish both good oral and systemic health. Hence the objective of this study is to evaluate the clinical efficacy of Scaling and root planing(SRP) with probiotics as an adjuvant therapy in patients with chronic periodontitis and halitosis.

OBJECTIVES

- To evaluate the clinical efficacy of Probiotics by using clinical parameters like Plaque index, Gingival index and Probing depth.
- To evaluate the clinical efficacy of Placebo by using clinical parameters like Plaque index, Gingival index and probing depth.
- To compare the clinical efficacy of Probiotics and Placebo using clinical parameters like Plaque index, Gingival index and probing depth.
- To evaluate the Halitosis by using BANA test & Organoleptic rating

MATERIALS AND METHODS

- This study was conducted according to protocol approved by the Ethical committee and Research Review Board.
- This study was Randomly categorized into 2 Groups as Group A & B. Each group was tested with corresponding regimen.
- 30 systematically healthy individuals with chronic periodontitis and Halitosis are qualified for assessment.

- **INCLUSION CRITERIA:** Subjects with chronic periodontitis and Halitosis, within the age group of 20-65 years with good general health.
- **EXCLUSION CRITERIA:** Pregnant / Lactating mothers, history of allergies, Subjects with any systemic illness.
- Two trials- Group A & B with 15 participants each were categorized by Randomization using coin-toss method.
- In group A: Probiotic mouth rinse [PERFORA THYME] diluted with distilled water in the ratio of 2:1 is given after scaling and a subgingival delivery of probiotic solution is administered after Root planning. Post-operatively, Probiotic mouthrinse is prescribed for the subjects for 6 weeks.
- Presence of bacteria like Porphyromonas gingivalis, Treponema denticola produces waste products that hydrolyzes synthetic trypsin substrate and causes Halitosis.
- Samples of saliva from the dorsum of the tongue and plaque sample from four test sites(permanent 1st molar from each quadrant) were collected and are placed within the BANA impregnated lower matrix.
- The test strip consists of Benzoyl-DL-arginine-ß-naphthylamide.
- Presence of the red complex bacteria degrades the BANA compound by producing an enzyme.
- The test compound changes colour indicating +ve reaction.

Organoleptic rating was compared with preoperative and postoperative period.

GUIDELINES

Scoring is done normally according to the intensity scale of Rosenberg, where 0-absence of odour,

1- Barely noticeable odour,

2- Slight malodour,
3- Moderate malodour,
4- Strong malodour,
5- Severe malodour.

- In Group-B: Placebo mouthrinse diluted with water as the ratio same as in Group-A [2:1] given after scaling and a subgingival delivery of placebo solution is administered after root planning. Placebo mouthrinse is prescribed for the subjects for 6 weeks post-operatively.
- Gingival index, Plaque index, Probing depth and BANA test were the clinical paramaters that are checked at the Baseline and after 6 weeks.
- Inter-group and Intra-group comparison were made.

STATISTIC ANALYSIS

- All the data were recorded in Proforma and were statistically analysed using SPSS-20 [Statistical Package for Social Sciences]
- It is the software used for statistical analysis of the present study.
- Student paired t-test was employed for comparison between Intergroup and Intragroup.
- For all the test, a $p<0.05$ was considered as statistically significant.

RESULT

Result shows significant reduction in the probing depths, GI & PI after treatment in probiotic local drug delivery group. All data were statistically analyzed using SPSS-12 Software with paired 't' test applied between the two groups.

Table 1: Mean gingival index [Loe H and Silness J].

GROUPS	BASELINE	AFTER 4 WEEKS	P VALUE
GROUP A [PROBIOTIC]	2.20 ± 0.676	0.20 ± 0.414	0.000
GROUP B [PLACEBO]	2.33 ± 0.617	0.67 ± 0.617	0.000

Table 2: Mean Plaque Index.

GROUPS	BASELINE	AFTER 6 WEEKS	P VALUE
GROUP A (Probiotic)	2.27 ± 0.704	0.20 ± 0.414	0.001
GROUP B (Placebo)	2.60 ± 0.507	0.53 ± 0.516	0.001

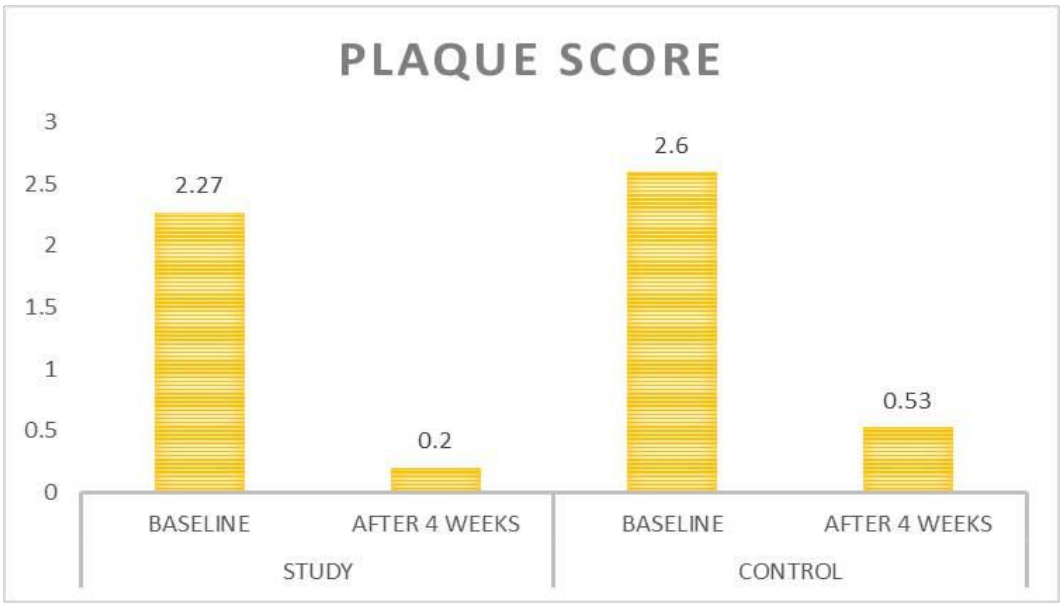
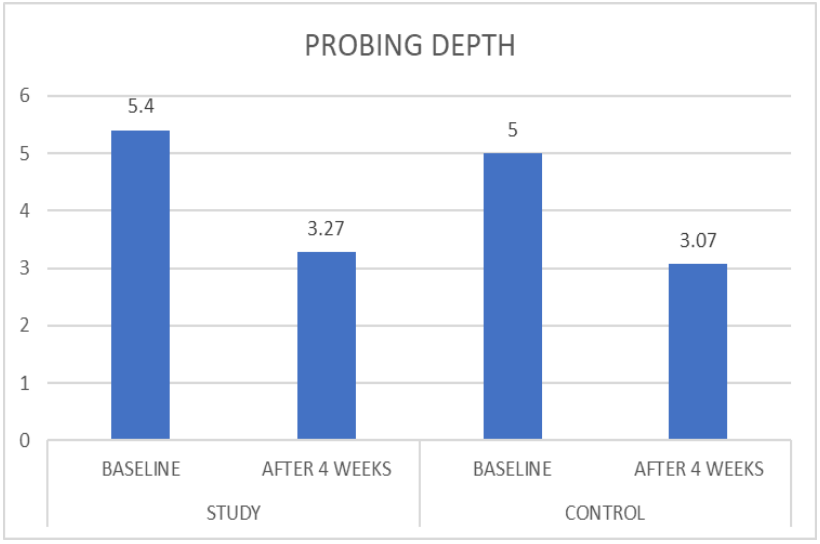
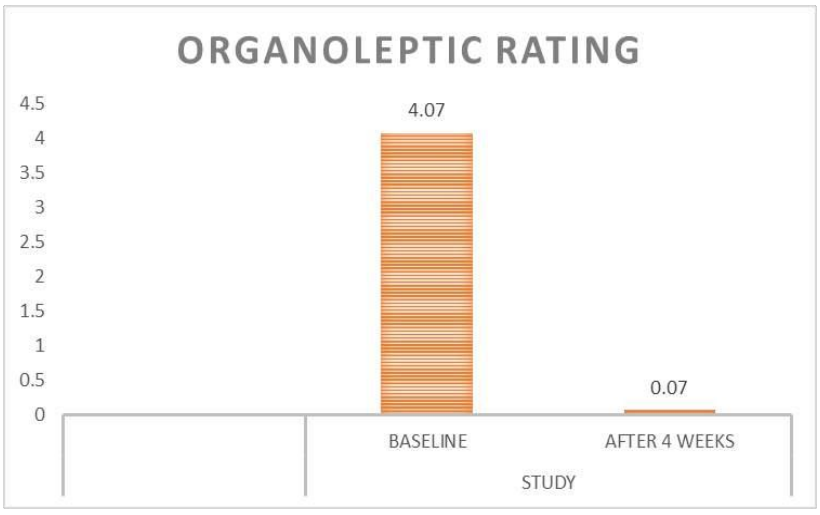


Table 3: Mean Probing Pocket Depth.

GROUPS	BASELINE	AFTER 6 WEEKS	P VALUE
GROUP A (probiotic)	5.40 ± 0.507	3.27 ± 0.458	0.000
GROUP B (placebo)	5.00 ± 0.000	3.07 ± 0.258	0.000





DISCUSSION

- In this present study, adjuvant use of probiotics lead to significant improvement in GI & PI which are in accordance with the study conducted by Krasse et al., 2006 and Noordin and Kamin et al., 2007.

- Vicario et al., 2013 conducted a study, he showed significant reduction in periodontal probing depth and improvement in Clinical attachment level which is similar to our study.
- Our study showed significant reduction in the pathogenic bacterial count in accordance with the study conducted by Scully C, Greenman., 2008 due to the removal of volatile sulphur compounds including H2S and Methylmercaptan produced by anaerobic bacteria.
- Laleman et al., in his study which is in accordance with our study, stated that a significant reduction in periodontal pocket depth and improvement in clinical attachment level were found by using Streptococci containing probiotic in periodontal therapy.
- Tagg JR, Dierksen KP et al., conducted a study on Bacterial replacement therapy using Probiotics reported to be protective against Streptococcus pyogenes and oral malodour.
- Tekce M, Ince G, Gursoy H, Dirikan Ipci S, Cakar G et al., in their study discussed about the clinical and microbiological effects of probiotic lozenges in the treatment of chronic periodontitis.
- Penala et al., proved the use of probiotics as an adjunct to scaling and root planing has significant reduction in pocket depths and reduced oral malodour.

CONCLUSION

- Use of probiotics as an adjuvant to scaling and root planning is very effective, convenient to use with lesser side effects when compared to conventional methods.
- Periodontal diseases are associated with systemic conditions and the emerging development of probiotics in the fascinating field of dentistry is setting a horizon as an assuring choice of therapy in treating oral as well as systemic diseases.

CLINICAL SIGNIFICANCE

- The purpose of this study is to reduce the no. of anaerobic bacteria that produce volatile sulphur compounds and to increase the beneficial-aerobic bacteria [i.e: Lactobacillus rhamnosus, Lactobacillus acidophilus] thus giving a promising choice of therapy to establish both good oral and systemic health.[7]

LIMITATIONS

- Sample size should be increased.
- Long-term follow up.
- Further studies to understand the different probiotic strains has to be developed that might broaden the field of potential applications.

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