

**World Inventia Publishers** 

Journal of Pharma Research

http://www.jprinfo.com/



Vol. 8, Issue 5, 2019

ISSN: 2319-5622

# **Research Article**

# FULLMOUTH ONE STAGE DISINFECTION VERSUS CONVETIONAL TWO STAGE SRP IN TREATMENT OF CHRONIC ADULT PERIODONTITIS – A PILOT STUDY

Dr. Surekha Reddy, Dr. Nithya Anand, Dr. Swetha Gadde \*, Dr. S.C. Chandrasekaran, Dr. Bagavad Gita Sree Balaji Dental College, Chennai, Tamilnadu, INDIA.

#### Received on: 03-04-2019; Revised and Accepted on: 15-05-2019

## ABSTRACT

**Background:** Conventional periodic scaling and root planing is carried out at two weeks interval to enable immune response to maintain a host-parasite equilibrium. This time lag will result in sub-gingival re-infection which may impair healing. A new treatment approach such as full-mouth disinfection completed in two consecutive days has been suggested to combat sub-gingival re-colonization. However, there exist some controversies in the two treatment modalities on clinical benefits. This study thus aimed to compare the effectiveness of full mouth one-stage disinfection and two stage scaling and root planing in chronic periodontitis.

**Materials and Methods:** A total of 12 Patients were selected and randomly allocated to two groups with different treatment modalities. One group received full mouth one stage disinfection (FMD) and the other group received conventional scaling and root planing (SRP). Plaque index, bleeding index, probing pocket depth, serum WBC count and sub-gingival plaque bacterial load were evaluated for both the groups at baseline and at 21 days post-treatment.

**Results:** The obtained data from all the parameters were analyzed using Student paired t test. Both treatment modalities lead to a significant improvement of clinical, hematological and microbiological parameters ( $p \le 0.05$ ). However comparison between the two groups showed no significant difference with high improvement in clinical parameter and high reduction in hematological and microbiological parameter in full mouth disinfection group.

Conclusion: Both treatment modalities have a better clinical improvement with a limited benefit of SRP over FMD.

**KEYWORDS:** Chronic periodontitis, Full mouth One stage Disinfection, SRP.

#### **INTRODUCTION**

**P**eriodontitis develops primarily when the microbial load within the periodontal pocket countermand the local and systemic defense mechanism. This imbalance can result from three factors such as i) a susceptible host (reduction in the efficiency of immune response), ii) presence of overgrowth of pathogenic species above a certain threshold level, iii) the absence of beneficial bacteria such as prebiotics and probiotics (Lactobacillus strains) <sup>[1]</sup>. The susceptibility of the host is partially by hereditary and genetic factors, that is inadequate or under regulated immunological response and partially by environmental factors such as bad oral hygiene, smoking, immunosuppressive medication, stress, etc <sup>[2]</sup>. The hereditary and genetic aspect seems to play a major role in early onset of

\* Corresponding author: Dr. Swetha Gadde Sree Balaji Dental College, Chennai, Tamilnadu, INDIA. \* E-Mail: <u>swetha.gdd@gmail.com</u>

DOI: https://doi.org/10.5281/zenodo.3236681

periodontitis <sup>[3]</sup>. Such patients often respond less favorably to conventional therapy, so there is a need for local antibiotic therapy. *Actinobacillus actinomycetemcomitans, Tanneralla forsythia and Porphyromonas gingivalis* are the initial etiological periopathogens which not only colonize the sub-gingival area but also colonize mucosa, tongue, tonsils and also saliva <sup>[4]</sup>. Along with these periopathogens, key pathogens such as *Prevotella intermedia, Campylobacter rectus, Peptostreptococcus micros, Fusobacterium nucleatum, Eubacterium nodatum, Streptococcus intermedius and spirochetes* colonize the above mentioned niches.

Since the susceptibility of the host cannot be altered clinically, the present periodontal therapy is mainly focused on the reduction/elimination of periopathogens along with antiinflammatory medications in combinations with the reestablishment (often by surgical pocket elimination) of a suitable environment (less anaerobic) with beneficial microbiota <sup>[5]</sup>. An initial phase treatment of single course scaling and root planning (SRP) is often used to reduce a proportion of sub-gingival pathogens temporarily. However, within a week the periodontal pockets are re-colonized by the initial pathogens but with a less bacterial composition <sup>[6]</sup>. Still there exist a debate that where does the recurrent bacteria originate from? It has been reported that they can originate from multiplication of bacteria remaining within the pocket [7] or within the junctional epithelium [8] and or the dentinal tubules. Intra-oral translocation of periodontal pathogens from one niche to another, especially from supra-gingival to sub-gingival area exist which has been recently suggested in microbiological study <sup>[9]</sup>. The role of supra-gingival flora on sub-gingival recolonization is being underestimated so far. Thus, a concept of maintenance which is scaling and root planning for every three months has been adopted to provide periodic reduction of bacterial challenge, thereby enabling the immune response to maintain a host-parasite equilibrium [10]. It has been suggested that the efficacy of periodontal therapy can be enhanced with full-mouth root planing (two, 2-hour sessions within 24 hours) with adjuvant chlorhexidine chemotherapy to other oral niches will improve clinical and microbiological results when compared to standard therapy that is root planing of one quadrant at a time for one hour at 2-week interval [11]. With this background, the present aims to compare the efficiency of one stage full mouth disinfection and two stage SRP in chronic periodontitis.

#### **MATERIALS AND METHODS**

This short-term pilot study recruited 12 patients of age group 20 – 40 years with chronic periodontitis to determine the efficiency of full mouth disinfection and SRP both clinically, hematologically and microbiologically. The 12 patients were randomly allocated to a test and control group, constituting 6 patients in each group. Though this was pilot study, the patients were blinded for what type of treatment they have received. The patients in both groups were treated simultaneously. All subjects were medically healthy (no diabetes, rheumatic arthritis, renal diseases, cardio-vascular disease) and none of them had undergone any periodontal therapy within six months and used any systemic or local antibiotic therapy within three months before or during the study. It had been ensured that none of the subjects had the habit of smoking or chewing tobacco. Each patient had at least 20 natural teeth with 2 multirooted teeth and 3 single-rooted teeth in each quadrant with, per quadrant, at least having 4 sites a probing pocket depth  $\leq$ 4mm or greater which also bled on probing. The informed consent from each patient was obtained after explaining the necessity of the study. Patients were randomly distributed between two treatment groups after obtaining informed consent. The study protocol received ethical approval from the institutional review board before the commencement of the study.

The patients in the control group (6 subjects) received scaling and root planing quadrant by quadrant with a time interval of 14 days. They also received oral hygiene instructions without any antiseptics. In the test group (5 subjects), a full mouth disinfection treatment was performed. The full mouth disinfection treatment included full mouth debridement (removal of plaque and calculus) completed in two visits within 24 hours period. In addition to scaling and root planing, the tongue of the subjects were brushed with chlorhexidine gel (1%) for one minute and their mouth were rinsed with chlorhexidine solution (0.2%) for 2 minutes, and the periodontal pockets were irrigated with chlorhexidine solution (1%). At the baseline (before to the first session of scaling and root planing) and 21 days later (post-operative), the clinical parameters such as gingival index (Loe and Silness, 1963), plaque index (Silness and Loe, 1964), periodontal pocket depth, and plaque samples from the left upper quadrant, which was chosen for its accessibility were taken. Along with these parameters, venous blood was collected to assess the white blood cell count (WBC) pre-operatively and post-operatively from both the study groups.

The principle investigator performed scaling and root planing to all patients both in test and control group after gingival infiltration with a local anesthetic using assortment of periodontal curettes (Hu-Friedy). This treatment took approximately one hour per quadrant along with prophy paste polishing. Mandibular teeth were treated first and followed by maxillary teeth. In the test group, after debridement full mouth disinfection was carried out in chronological order by brushing the dorsum of the tongue by the patients with 1% chlorhexidine gel for 60 seconds, followed by mouth rinsing twice with chlorhexidine 0.2% solution for one minute and sub-gingival irrigation performed using 1% chlorhexidine solution of all pockets by inserting a syringe with a blunt needle until some resistance was met. This sub-gingival irrigation alone was repeated after one week. The subjects in test group were additionally advised to rinse twice daily for one minute with 0.2% chlorhexidine during 21 days.

Oral hygiene instructions such as interdental plaque control using toothpicks or interdental brushes and brushing of the dorsum of the tongue twice daily were given to the subjects in both the groups with re-instructions at each visit such as 2, 7, 14, 21 days. Pre -operatively and post-operatively the plaque samples were collected from multi-rooted teeth in the upper left quadrant using gracey curettes. The samples were taken from sub-gingival plaque after removal of supra-gingival plaque with an intention not to disturb the sub-gingival microbial flora. The obtained plaque samples were placed in a containment tube containing brain heart infusion broth. The plaque samples in the broth were plated on blood agar plates after 10 fold serial dilution. The streaked plates were then incubated in air with 5% CO<sub>2</sub> for three days. After, this period, the total number of colony forming units (CFU/ml) was counted. Each colony type was characterized by color, morphology, size and translucency. The bacterial load of each perio-pathogenic organisms were quantified then.

The pre-operative and post-operative clinical assessment data such as gingival index score, plaque index score, periodontal probing depth value and clinical attachment loss value were entered in a Microsoft spread sheet. Similarly the WBC count and microbial load (CFU/ml) data pre-operative and post-operative were also entered analyzed using SPSS software 20. Pre-operative and post-operative data were compared using student's paired t test.

#### RESULTS

**A** total of 12 patients with chronic periodontitis were enrolled and there was no drop out during the entire 21 days study. At baseline no significant differences in the gingival score, plaque score and probing pocket depth (p>0.5) was observed between the patients in two treatment modalities. Table.1 showed that there was a statistical difference in the preoperative and post-operative gingival scores among the patients in two groups (p=0.011, 0.003).

Table No. 1: Comparison	of clinical parameters	among SRP and FMD gro	oups
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Variables	Ν	SRP group		p value	FMD group		p value
		Pre-op	Post-op		Pre-op	Post-op	
Gingival Index	12	1.15±0.39	0.61±0.33	0.011*	1.16±0.28	0.66±0.19	0.003*
Plaque Index	12	0.95±0.22	0.41±0.19	0.023*	$1.05 \pm 0.31$	0.68±0.15	0.032*
Probing pocket depth	12	5.54±1.98	3.91±1.5	0.010*	4.95±0.85	3.37±0.72	0.001*

However, full mouth disinfection group had a highly statistical significant difference compared to scaling and root planing group. Similarly, there was a significant difference in the pre-operative and post-operative mean plaque score (p=0.023, 0.032) among SRP and FMD groups. Also, there was a statistical significant difference in the pre-operative and post-operative mean probing pocket depth in the two groups (p=0.010, 0.001) with a high pocket depth reduction in FMD group.

Comparison of white blood cell counts showed no statistical difference among the patients in both the groups pre-

operatively and post-operatively (p=0.675, 0.165) (Fig.1). Though there was no difference in pre-operative and post-operative WBC count, a high reduction in WBC count was observed in FMD group (350 cells) compared to SRP group (100 cells). There was no statistical significant difference in the mean bacterial load at baseline and at 21 days among the patients in SRP group (p=0.451). However, there was a statistical significant difference in the mean bacterial load in the SRP group between baseline and at 21 days (p=0.026).



## Fig.1 Comparison of WBC count among SRP and FMD group





## DISCUSSION

**T**his study indicates repeatedly that full mouth disinfection with chlorhexidine mouth rinse and chlorhexidine sub-gingival irrigation to periopathogens to all niches, results in additional clinical and microbiological improvements when

compared to conventional SRP treatment. The observations in this study are supported by the earlier study results <sup>[12, 13]</sup>. Study have also stated that there is a significant reduction in the number of colony forming unit (CFU) among the chlorhexidine and root planing group compared to only root planing group <sup>[14]</sup>. The significant reduction in the probing depth (p=0.001) in the

present study observation is in consistency with the studies which has reported the same on comparison with standard therapy in patients with chronic adult periodontitis on long term observations <sup>[15, 16]</sup>. A critical commentary on full-mouth therapy versus individual quadrant root planing on single and multi-rooted teeth reports a significant reduction in pocket depth and microbial load in full mouth disinfection therapy compared to quadrant root planing therapy <sup>[17]</sup>.

A significant reduction in the plaque score among the study participants is similar to the study result on patients with drug-induced gingival overgrowth using full mouth disinfection for 6 months <sup>[18]</sup>. A randomized control trial systematic review on full mouth disinfection versus scaling and root planing per quadrant in aggressive periodontitis has shown a significant reduction in the gingival bleeding score, plaque score, probing depth and bacterial re-infection with side-effects such as fever and herpes labialis in FMD treatment <sup>[19]</sup>. Though the results of the present study are similar to the results of systematic review, the present study failed to assess the side-effects of the treatment strategies. This could be attributed to the fact that side-effects of any treatment will be observed over a long period (>3 months).

A randomized control trial on the effects of One-Stage Full-Mouth Disinfection and Quadrant-Wise Scaling and Root Planing on Serum Levels of IL-17 and IL-1β and Clinical Parameters for 2 months and 4 months interval showed not only a reduction in the means of IL-17 and IL-18 serum levels in both treatment modalities but also exhibited clinical parameter improvements in both groups (bleeding on probing (BOP), clinical attachment level (CAL), probing depth (PD) and modified gingival index (MGI)) with no statistical significant differences between the two study groups. Even the present study showed no statistical significant difference in plaque, gingival score and probing pocket depth among the SRP and FMD group, however high improvement in those clinical parameters have been reported in FMD group compared to SRP group [20]. A study evaluated the effect of one stage versus two stage full mouth disinfection on C-reactive protein and leucocyte count in patients with chronic periodontitis has reported a significant reduction in leucocyte count in both the groups after 1 month with a high reduction in two stage full mouth disinfection [21]. The present study although showed no significant difference in WBC count at baseline and at 21 days among two groups, however, the reduction was found high in FMD group compared to the SRP group which is similar to the results in the above mentioned study. Also a study which compared one stage versus two stage non-surgical periodontal therapy and their effect on WBC count showed a high reduction in WBC count on two stage non-surgical periodontal therapy with no significant difference in the WBC count among two groups<sup>22</sup> supporting the results of the present study.

Though this study showed significant reduction in clinical and microbiological parameters, it is not free from limitations. Limitations of this study include small sample size and also the short time period. Since this is a pilot study, further studies with long duration and large sample size are required to extrapolate the study result.

#### CONCLUSION

The two treatment strategies (SRP and FMD) showed significant improvements in clinical parameters providing its clinical efficiency. However, SRP had limited additional benefit

over FMD in the treatment of chronic periodontitis, as later one has an additional advantage of significant bacterial load reduction which prevents cross-contamination. Though comparison between two treatment modalities on hematological parameter (WBC) showed no statistical significant difference after 21 days, a better reduction is seen in FMD group, which benefits the patient and the clinician.

## **REFERENCES:**

- 1. Socransky SS, Hafajee AD. The bacterial etiology of destructive periodontal disease: Current concepts. J Priodontol **1992**;63:322-331.
- 2. Kinane DF. & Hart TC. Genes and gene polymorphisms associated with periodontal disease. Crit Rev in Oral Biol & Med **2003**;14:430–449.
- 3. Michalowicz BS. Genetic and heritable risk factors in periodontal disease. J Periodontol **1994**;65:479-488.
- Beikler T, Abdeen G, Schnitzer S, Salzer S, Ehmke B, Heinecke A. & Flemmig TF. Microbiological shifts in intra- and extraoral habitats following mechanical periodontal therapy. J Clin Periodontol 2004;31:777– 783.
- 5. Socransky SS. & Haffajee AD. Dental biofilms: difficult therapeutic targets. Periodontol **2002**;28:12–55.
- Socransky SS, Smith C. & Haffajee AD. Subgingival microbial profiles in refractory periodontal disease. J Clin Periodontol 2002;29:260-268.
- 7. Petersilka GJ., Ehmke B. & Flemmig TF. Antimicrobial effects of mechanical debridement. Periodontol 2002:28:56–71.
- 8. Lamont RJ. & Yilmaz O. In or out: the invasiveness of oral bacteria. Periodontol **2002**;30:61–69.
- Quirynen M, Vogels R, Pauwels M, Haffajee AD, Socransky SS, Uzel NG. & van Steenberghe D. Initial subgingival colonization of "pristine" pockets. J Dent Res 2005;84:340–344
- 10. The American Academy of Periodontology. Supportive periodontal therapy (SPT) (position paper). J periodontal **1998**;69:502-506.
- 11. De Soete N, Mongardini C, Pauwels M, et al. One-stage full-mouth disfinfection. Long-term DNA-DNA hybridization. J Periodontol **2001**;72:374-382.
- De Soete M, Mongardini C, Pauwels M, Haffajee AD, Socransky SS, van Steenberghe D. & Quirynen M. Onestage full-mouth disinfection. Long-term microbiological results analyzed by checkerboard DNA-DNA hybridization. J Periodontol **2001**;72:374– 382
- 13. Quirynen M, De Soete M, Boschmans G, Pauwels M, Coucke W, Teughels W, van Steenberghe D. Benefit of "one-stage, full-mouth disinfection" is explained by disinfection and root planing within 24 hours: a randomized controlled trial. J Clin Periodontol **2006**; 33:639–647.
- 14. De Soete M, Dekeyser C, Pauwels M, Teughels W, van Steenberghe, D, Quirynen, M. Increase in cariogenic bacteria after initial periodontal therapy. J Dent Res **2005**;84:48–53.
- Quiynen M, Mongardini C, Pauwels M, Bollen MLC, Eldere JV, Steenberghe D.V. One-stage Full-versus Partial-Mouth Disinfection in the Treatment of Chronic Adult or Generalized Early-Onset Periodontitis II. Long-Term Microbial Load. J Periodontol **1999**;70(6): 646-656.

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- Claudio Mongardini, Daniel Van Steenberghe, Christel Dekeyser, Marc Quirynen. One-stage Full-versus Partial-Mouth Disinfection in the Treatment of Chronic Adult or Generalized Early-Onset Periodontitis I. Long-Term Clinical Observations. J Periodontol 1999;70(6): 632-645.
- 17. Gary Greenstein. Full-Mouth Therapy Versus Individual Quadrant Root Planing – A Critical Commentary. J Periodontol **2002**;73(7):798-812.
- Aena Jain Pundir, Siddharth Pundir, RK. Yeltiwar, Sana Farista, V. Gopinath, TS. Srinivas. Treatment of druginduced gingival overgrowth by full-mouth disinfection: A non-surgical approach. J Ind Soc Periodontol **2014**;18:311-5.
- 19. Maísa Casarin, Danilo Antonio Milbradt Dutra, Michely Ediani Machado, Raquel Pippi Antoniazzi, Fabricio Batistin Zanatta. Full Mouth Disinfection Versus Scaling and Root Planing per Quadrant in Aggressive

Periodontitis: A Systematic Review. EC Dental Science **2016**;4.4: 822-834.

- Shirmohammadi A, Babaloo Z, Eskandari A, Purabbas R, Babaloo A. The Effects of One-Stage Full-Mouth Disinfection and Qua-drant-Wise Scaling and Root Planing on Serum Levels of IL-17 and IL-1β and Clinical Parameters (A randomized Controlled Trial Study). J Dent (Tehran) **2013**;10(3):248-55.
- 21. Pabolu CM, Mutthineni RB, Chintala S, Naheeda, Mutthineni N. Evaluation of the effect of one stage versus two stage full mouth disinfection on C-reactive protein and leucocyte count in patients with chronic periodontitis. J Ind Soc Periodontol **2013**;17(4):466-71.
- 22. Sambashivaiah S, Rebentish PD, Kulal R, Bilchodmath S. One stage versus two stage non-surgical periodontal therapy and their effect on WBC count. Int J Clin Dent Sci **2010**;1:38–44.

## How to cite this article:

Dr. Swetha Gadde et al. FULLMOUTH ONE STAGE DISINFECTION VERSUS CONVETIONAL TWO STAGE SRP IN TREATMENT OF CHRONIC ADULT PERIODONTITIS – A PILOT STUDY. J Pharm Res 2019;8(5):306-310. DOI: https://doi.org/10.5281/zenodo.3236681

Conflict of interest: The authors have declared that no conflict of interest exists. Source of support: Nil