



COMPARISON OF BACTERIAL COUNT IN SALIVA AFTER FULL MOUTH SCALING TREATMENT VERSUS FULL MOUTH DISINFECTION WITH USE OF 0.12% CHLORHEXIDINE MOUTHWASH

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ABSTRACT

Aim and objective: The aim of this study is to compare Comparison Of Bacterial Count In Saliva After Full Mouth Scaling Treatment Versus Full Mouth Disinfection With Use Of 0.12% Chlorhexidine Mouthwash. **Background:** Anti-infective nonsurgical therapy includes both mechanical and chemotherapeutic approaches. Regular chemotherapeutic home-care by patients, such as applying chlorhexidine mouthwash, is generally very effective in controlling most inflammatory periodontal diseases, when used in conjunction with the professional removal of dental plaque. **Reason:** Chlorhexidine is a well-known antiseptic for anti plaque action with a long substantivity. Hence, the purpose of the study is to assess and compare the microbial count in saliva with and without rinsing the mouth with 0.12% chlorhexidine mouthwash following oral prophylactic scaling treatment.

KEYWORDS: Chlorhexidine, Full mouth scaling, full mouth disinfection, 0.12% concentration, bacterial count.

INTRODUCTION

Periodontal disease is a mixed infection of supporting structure of teeth by periodontal microbes and plaque biofilm and calculus. The activity of the disease is dependent on the susceptibility of the host, an increase in the number of pathogenic microbes and a decrease in the number of advantageous microbes.

The treatment of chronic inflammatory periodontal diseases comprises mainly the reduction or elimination of bacteria. Hence treatment modalities like scaling, Root planning are recommended to reduce the microbial load in the sulcus of periodontal pockets. However, it has been shown that periodontal pathogens can establish not only in periodontal pockets and also on the tongue, tonsils or on other oral mucous membranes (Van Winkelhoff et al. 1988).^[1] Therefore, they can cause a re-infection of the periodontal pockets after periodontal treatment (Van Winkelhoff et al. 1988).^[2] In order to minimise the risk of bacterial reinfection, Quirynen et al. 1995^[3] introduced one-stage full-mouth disinfection where scaling and root planing was performed in two sessions within 24 h supplemented with supra and sub gingival use of chlorhexidine.

Most of the studies have used 0.2% chlorhexidine. Results have not been very conclusive. Recently with the introduction of 0.12% chlorhexidine, we aim at finding the effectiveness of it.

MATERIALS AND METHODS

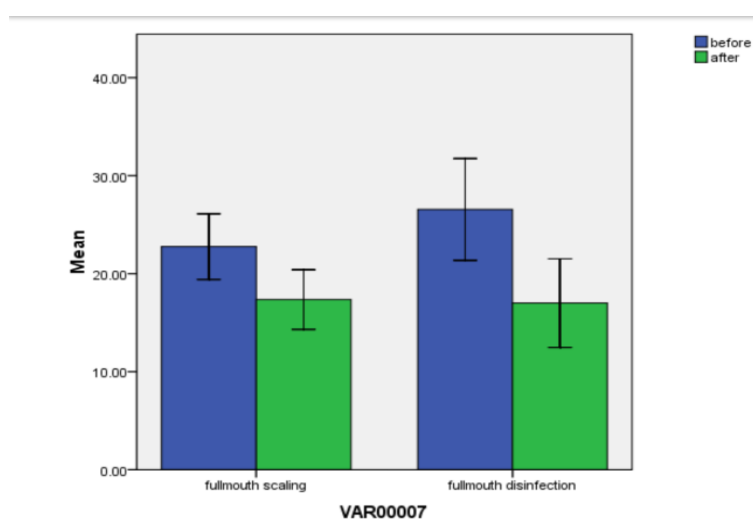
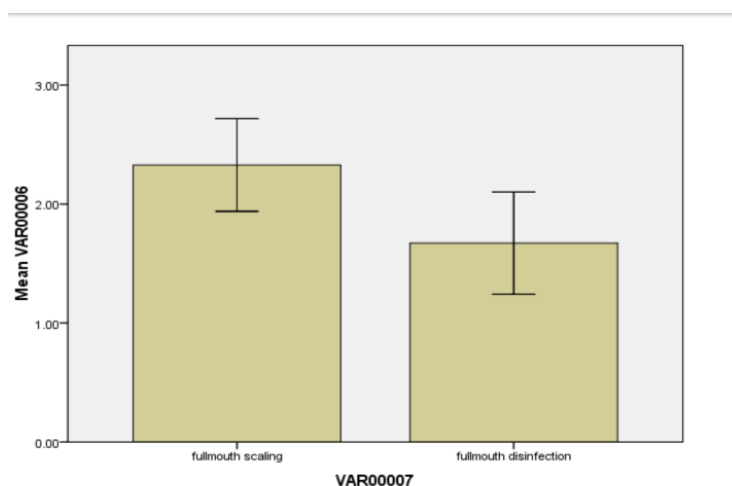
Patients who reported to Saveetha Dental College, were screened for Generalized Chronic Gingivitis and Generalized Chronic Periodontitis. 63 patients were satisfied with the criteria and informed about the study, Out of which 50 patients agreed to work with us. The patients were then randomly divided into two groups, Group A and Group B. Patients in Group A underwent Full Mouth Scaling and patients in Group B underwent Full Mouth Disinfection, which involves rinsing with 0.12% chlorhexidine, tongue brushing, gargling and irrigation of the subgingival pockets using 0.12% chlorhexidine.

Group A consisted of 25 patients among which 19 were males and 6 females with a mean OHIS of 2.328. Group B consisted of 25 patients among which were 13 males and 12 males with a mean OHIS of 1.672. Salivary samples of patients in both Groups were collected prior to the treatment. The samples were collected using Sterile uricol containers. Group A patients underwent Full Mouth Scaling and Group B patients underwent Full Mouth Disinfection with

0.12% Chlorhexidine Mouthwash. Salivary samples were collected one hour later. The salivary samples were cultured using MacConkey Agar. The bacterial colonies were counted for before and after treatment.

RESULTS

Group A consisted of 25 patients among which 19 were males and 6 females with a mean OHIS of 2.328. Group B consisted of 25 patients among which were 13 males and 12 males with a mean OHIS of 1.672. The results statistics were done with SPSS software. The mean bacterial count of Group A before Treatment was 2.875 ± 0.56 and the mean bacterial count of Group B before treatment was 2.965 ± 0.97 . The mean bacterial count of group A after treatment was 2.328 ± 0.94 and Mean Bacterial count of Group B after treatment was 1.672 ± 1.041 . Hence, showed that Group B had a decrease in bacterial count, but not very significant.



DISCUSSION

The one stage full mouth disinfection was introduced to overcome the conventional treatment's drawbacks. The treatment completes full mouth scaling and root planing within 24 hours period and combines CHX disinfection hoping to reduce the chance of cross-contamination. It fulfils the criteria of a successful periodontal treatment in that it should result in elimination or reduction of the exogenous pathogens and changes in the endogenous flora.

In the present study, group B was treated by ultrasonic tooth debridement in one visit in combination with irrigation of all pockets rinsing with a 0.12% Chlorhexidine solution. Full Mouth scaling was performed in Group A in one sitting. The pre and post treatment salivary samples were collected as a clinical parameter and the bacterial colonies were counted.

The mean bacterial count of Group A before Treatment was 2.875 ± 0.56 and the mean bacterial count of Group B before treatment was 2.965 ± 0.97 . The mean bacterial count of group A after treatment was 2.3280 ± 0.94 and Mean Bacterial count of Group B after treatment was 1.6720 ± 1.041 . Hence, showed that Group B had a decrease in bacterial count, but not very significant.

No Research was done using the bacterial count before and hence there was no possibility of comparing the results with results from other studies.

Mongardini *et al.* Found differences between FMD and Q-SRP in CAL gain ranging from 0.8mm to 1.9mm. Mongardini *et al.* found no statistically significant differences between the FMD and control groups (MST) for teeth with moderate pockets, as the test group had better results (0.2 mm differences) for both single-root and multi-root teeth. Moreover, no significant differences were found for teeth with deep pockets, as the test group had better results with 0.8 mm for single-root teeth and 0.3 mm for multi-root teeth.^[4]

Moreira and Feres-Filho who did not perform separate analyses for single-root and multi-root teeth, found a 0.3 mm difference favouring the control group (Full Mouth Scaling) in moderate pockets and an 0.2 mm difference favouring the control group in deep pockets.^[5]

Quirynen *et al.* reported that the FMD treatment resulted in statistically significant additional CPD reduction of 0.8mm in deep pockets (≥ 7 mm) in single rooted teeth compared to the Q-SRP, although the benefit could not be observed for the multi rooted teeth.^[6]

In 2008, Eberhard *et al.* tried to make a conclusion from the studies about the one stage full mouth disinfection (FMD).^[7] They concluded that the treatment had modest effect on periodontal care and the difference with the conventional standard treatment was not significantly different. The role of CHX is probably the most debated one.

Apatzidou *et al.* evaluated the effect of FMD techniques on antibody titers and reported that both treatment modalities resulted in a decrease in antibody titers during a six-month period, with no significant differences between the two techniques consistent with the results of the present study.^[8]

After a long time of quadrant treatment, the concept of one-stage full mouth disinfection emerged to avoid transmission of pathogenic microorganisms from not treated periodontal pockets to those recently debrided and thus in the healing process. The original protocol proposed by Quirynen's group adopted combined mechanical and chemical procedures to eliminate plaque and/or calculus from teeth and other oral microbial reservoirs such as tongue and tonsils, thus promoting full-mouth disinfection within a 24-hour period. Periodontal pockets were irrigated by chlorhexidine rinse which was also used daily at home as an additional preventive measure to control biofilm formation. Some of the benefits of this protocol were related to a potential stimulus of the immunological response and a better cost-benefit relation.^[9]

Among several bacterial species capable of colonizing the human oral cavity, *Porphyromonas gingivalis*, a Gram-negative anaerobe colonizes distinct niches and is described as one of the major pathogens associated with periodontal breakdown. In relation to the total bacterial counts, levels of *P. gingivalis* are percentually higher in periodontally diseased sites than in healthy sites⁴ while *Streptococcus oralis* is known as the predominant colonizer in the early stage of dental plaque biofilm formation. Because of the microbial nature of periodontal disease its prevention requires reducing biofilm and educating individuals to a good level of oral hygiene.^[10] In despite of periodontal disease can be treated successfully by means of both mechanical nonsurgical and surgical therapy, periodontal maintenance therapy is a crucial factor for the success of periodontal treatment.

Quirynen and his coinvestigators reported that one-stage FMD resulted in significantly greater improvements than conventional quadrant-wise debridement.¹⁻⁵ Results coming from non-Leuven studies showed little difference between FMD and conventional treatment of

chronic periodontitis concerning microbiological-clinical profile of healing. Apatzidou et al. found no significant differences in the percentage of patients with classic pathogens (*P. gingivalis*, *A. actinomycetemcomitans*, *T. denticola*, *Tannerella forsythia* and *P. intermedia*) between one-stage (non-antiseptic) and quadrant-wise manner treatment after 6 months.^[10]

Christgau et al. (1998) suggesting that the decreased bacterial load has significantly decreased the level of inflammation and thereby decreasing the leukocyte count.^[11] In another study, Radafshar et al. (2010).^[12] has proposed that non-surgical periodontal therapy results in a significant decrease in circulating levels of CRP and WBC count.

In 1995, the Leuven Group proposed an original concept of the periodontal inflammation process control, implementing Full-Mouth Disinfection (FMD) protocol. This treatment strategy is based on one-stage concomitant mechanical and antiseptic influence on numerous ecologic niches colonized by periodontopathogens (supragingival tooth surfaces, periodontal pockets, saliva, oral mucosa, dorsal surface of the tongue, tonsils) in order to prevent translocation and crosscontamination and, consequently, as a repeated a la longue pocket recolonization.^[13] The transmission vectors of these microorganisms can be saliva, tools for oral hygiene practices, and dental instruments. Such procedure compressed in time was, in the authors' opinion, supposed to lead to a controlled induction of anti-bacterial response of the Schwartzmantype reaction.^[14] The indisputable benefits of such treatment model are: the reduction of the number of patient's visits and shorter, costefficient treatment. According to Quirynen and other Leuven Group members, FMD protocol should be performed specifically in patients at high risk of cross-contamination, with inadequate plaque control, and advanced periodontitis, as well as in subjects with a high amount of deposits in untreated areas. These authors still think that this is a treatment of choice in the case of chronic periodontitis (CP), although the first critical analysis of this treatment strategy was formed already in 2002 by Greenstein.^[15] A series of clinical and microbiological studies conducted by Quirynen and his coinvestigators reported that one-stage FMD resulted in significantly greater improvements than conventional quadrant-wise debridement. Results coming from non-Leuven studies showed little difference between FMD and conventional treatment of chronic periodontitis concerning microbiological-clinical profile of healing.^[16]

The periodontal procedures such as SRP performed in CP patients can lead to the translocation and release of the microorganisms from the oral cavity into the bloodstream which may play a significant role in the pathogenesis of atherosclerosis, thrombus formation,

leading to cerebral and myocardial infarction by different mechanisms. There is ever increasing evidence that components of fusobacteria sp. particularly the lipopolysaccharide, may promote atherosclerosis, affect blood coagulation, the function of platelets and prostaglandin synthesis systemically.^[17] Generally, the microorganisms in systemic circulation are eliminated by the reticuloendothelial system within a few minutes. Chronic low-level bacteremia and systemic inflammatory response have been suggested as a pathogenic link between periodontal disease and atherosclerosis.

P. gingivalis, is one of the many bacteria colonizing the mouth, found in different sites such as periodontal pockets, oral mucosa and tongue dorsum. It is a Gram-negative microorganism and an important etiologic agent of periodontal disease.^[18] Colonization by this pathogen results in tissue lesion due to the exacerbated production of a variety of virulence factors. Besides, this bacterium seems to have a significant role in the progression of chronic periodontitis and, in high levels, is usually related to deep periodontal pockets²⁶. Our study showed that, after therapy, there was a statistically significant reduction in the levels of *P. gingivalis* in comparison to baseline.^[19] It is known that some clinical periodontal parameters respond more quickly following treatment while others only manifest improvement or worsening later. *S. oralis* is known as the predominant colonizer in the early stage of dental plaque biofilm formation. Primary colonizers alter the surface not only by their physical presence but also they are likely to represent a new “surface-attached” phenotype with distinct metabolic activity and surface properties, thus altering their surroundings and creating new niches for other bacteria to colonize. This specie seems to be less pathogenic for periodontitis, and our results showed that the prevalence was markedly low in periodontitis patients, like *P. gingivalis*.^[20]

From the above it can thus be concluded that other articles have not shown significant results. With the change in concentration of chlorhexidine to 0.12%, it can be concluded that the effect of full Mouth Scaling and full Mouth Disinfection are not statistically significant.

CONCLUSION

Within the limits of this study, the one stage full mouth disinfection improves the gingivitis and periodontitis parameters meaningfully but no statistically significant differences were found between this procedure and the conventional quadrant wise scaling and root planing. Long-term studies with simultaneous bacteriologic investigations and more specific methods are recommended.

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