

Comparative Evaluation of Scaling and Root Planning versus Full Mouth Disinfection as a Nonsurgical Treatment for Chronic Periodontitis Patient

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ABSTRACT

Background: There are very less randomized, controlled clinical trials about the effect of non-surgical treatment for periodontitis patients on oral health-related quality of life (OHRQL). This clinical study aims to compare the effects of two different modalities of non-surgical periodontal treatment, scaling and root planing (SRP) per quadrant and one-stage full-mouth disinfection (FMD), on periodontal clinical parameters and OHRQL of patients having chronic periodontitis.

Materials and Methods: In this randomized, controlled clinical trial, the questionnaires Oral Impacts on Daily Performance (OIDP) and Oral Health and Quality of Life (OHQoL) were given to 20 patients who were divided into two groups: SRP (n = 10) and FMD (n = 10). Periodontal clinical parameters recorded including probing depth, clinical attachment level, plaque index, and gingival index. After 3 months, all the patients were re-examined for clinical parameters, and compared with the baseline values. Analyses were performed at T0 (baseline) for periodontal clinical parameters, T1 (30 days after treatment) for questionnaires, and T2 (90 days after treatment) for both.

Results: No significant differences were obtained between the SRP and FMD groups in respect to OHQoL and OIDP scores when the data of T1 and T2 were compared.

Conclusion: Patients who were treated by both SRP and FMD exhibited improvement in all periodontal clinical parameters and OHRQL, with no significant differences between both treatment groups.

Keywords: FMD(Full mouth disinfection), SRP (Scaling and root planing), quality of life.

INTRODUCTION

A healthy periodontium is essential for the long term survival of the dentition. To maintain periodontal health requires an identification and understanding of the many factors that give rise to the etiology of periodontal disease progression. Mostly all of the periodontal diseases are plaque induced. Plaque, or microbial biofilm, is a sticky secretion comprised of bacterial cells in a

polysaccharide media, which is attached to the teeth and other non-shedding surfaces by a glycocalyx. Conventional periodontal therapy performed in a quadrant-wise or sextantwise manner and is usually achieved in 4–6 weeks involves scaling and root planing. Most studies have utilized this protocol for nonsurgical periodontal treatment. Full-mouth disinfection, a novel approach suggested for the treatment of periodontal infections by the entire scaling and root planing in one stage within 24 h(

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Quirynen and coworkers in 1995).¹ This concept of full-mouth disinfection is based on the notion that in quadrant-wise therapy, a recently debrided pocket might be recolonized by pathogenic bacteria from remaining untreated pockets, or from other ecologic niches, if cross-contamination occurs between these sites.¹ The environment in a freshly instrumented pocket is suitable for pathogenic species growth and the individuals involved are known to be susceptible to periodontitis. Hence, early reinfection and recurrence of disease can be there due to such translocation of bacteria.²

Periodontal disease is composed of functional aspects of the stomatognathic system, such as mastication, swallowing, and speech, smile esthetics, and consequently self-esteem.^{3,4,5} Those with periodontal disease have a poorer perception of their oral health and worse quality of life (QoL), compared with healthy individuals.⁶ Methods for assessment have been designed to justify "subjective" oral health, from the standpoint of patients, and how daily activities are affected, interpersonal relationships, and psychologic well-being in recent years.^{7,8} These questionnaires are oral health-related quality of life (OHRQL) questionnaires,⁹ have been used in periodontology for investigation of the effect of periodontal therapy on OHRQL of patients who are periodontally compromised.^{10,11} The Oral Impacts on Daily Performance (OIDP) proposed by Adulyanon and Sheiham and Oral Health Quality of Life (OHQoL)-UK proposed by McGrath and Bedi¹² are the most commonly used.

Studies have shown that similar clinical results were obtained by non-surgical periodontal therapy, performed by SRP or FMD.^{1,13} Clinician and the patient can get a better result from the mechanical debridement, such as lower cost and more effective treatment and time management of the patient by FMD as therapy.^{13,14} The aim of the present study is to investigate and compare periodontal clinical parameters, using the OIDP and OHQoL, for evaluating the effect of two different types of periodontal treatment therapy, SRP and FMD, on the social, psychologic, and functional well-being of patients evaluated at two different times (baseline and 30 days after treatment).

MATERIALS AND METHODS

Study Design and Study Population

The study was conducted in the Department of Periodontics, Karnavati School of Dentistry, Gujarat, India. The study was approved by the Ethical Committee of the Karnavati School of Dentistry, India. (Ethical clearance No. KSD/16/048) Participants were informed about the objectives and methods of the study. After getting signed informed consent patients were included in the study.

Inclusion criteria: 1) diagnosis of mild to moderate chronic periodontitis; 2) aged 18 to 65 years; 3) both sexes; 4) smokers or non-smokers.

Exclusion criteria: 1) regular use of antibiotics or anti-inflammatory drugs within 3 months of the start of the study; 2) Use of mouthwash 2 times a day within 3 months before study entry; 3) allergy history of chlorhexidine; 4) antibiotic prophylaxis required for periodontal clinical examination; 5) presence of removable partial dentures and fixed or removable orthodontic devices; 6) Pregnancy and Lactation and 7) any medical or psychologic disorder that could affect the capability to understand the questionnaires.

Total 20 patients who fulfilled the inclusion/exclusion criteria were included in the study. They were randomly divided by coin toss method into two groups. SRP (n=10) per quadrant (30 minutes each), with weekly intervals between sessions; and FMD (n=10) performed in a single stage (within 24 hours).

Clinical examination were performed by single examiner to collect the following periodontal clinical parameters: probing depth (PD), clinical attachment level (CAL), plaque index (PI),¹⁵ gingival index (GI).¹⁶ at T0 (baseline), T1 (30 days) and T2 (90 days after the interventions). Measurements of PD and CAL were obtained at six sites per tooth in all present teeth, except third molars, with a manual PCP UNC 15 (Hu-Friedy, Chicago, IL) periodontal probe.

Quality of Life Data

The quality of life data were accessed by the two questionnaires at T0 (Base line), T1 (30 days after treatment) and T2 (90 days after treatment). OHQoL-UK¹² consists of 16 key issues evaluating the

effect that the teeth, mouth, gums, and dentures can have in different conditions related to four main aspects of quality of life, including functional limitations, pain or discomfort, and psychologic, social, and behavioural impacts. Response options range from 1 (very poor) to 5 (very good), and results vary from 16 (worst quality of life) to 80 (best quality of life). OIDP focuses on daily activities including eating, speaking, cleaning teeth, smiling, sleeping, maintaining emotional balance, working and studying, doing physical activity, and going out. It measures the impact of oral status on individuals' routines by analyzing the frequency and severity of responses. The occurrence of some difficulty is recorded dichotomously (yes/no), and the frequency is indicated by duration.

Statistical Analyses

Mean probing depth (PD), clinical attachment level (CAL), plaque index (PI), gingival index (GI), OHQoL and OIDP per group were calculated. As the distribution of data was too dissymmetric and variations from normal distribution were too high,

non-parametric tests were used. So, for statistical analysis, x2 test, Fisher exact test, Mann-Whitney U test, and Wilcoxon test were used.

RESULTS

The comparative analysis between SRP and FMD groups, and between T0 and T2, in relation to periodontal clinical parameters is shown in Table 1 to 4. A significant reduction ($P < 0.05$) in all periodontal clinical parameters like probing depth (PD), clinical attachment level (CAL), plaque index (PI), gingival index (GI) was seen between results of two group of study before and after treatment. It is important to highlight that this result was observed in both treatment protocols, showing that both resulted in clinical improvement. Moreover, there were no significant differences between the two treatment modalities.

Table 5 shows a comparative analysis between SRP and FMD groups of OIDP and OHQoL scores at 1 month and 3 months. There were no significant differences between groups and between the two assessments (T1 and T2).

Table 1: Comparison of probing depth for both the groups (statistically significant ($P < 0.05$))

probing depth						
		mean	N	Standard deviation	Standard error	p value
SRP group	At base Line	4.23	10	0.677	0.214	0.121
	After 3 months	3.36	10	0.608	0.192	0.031
FMD group	At base Line	4.3	10	0.184	0.184	1
	After 3 months	2.82	10	0.083	0.083	0.966

Table 2: Comparative analysis of both the groups for relative attachment level (statistically significant ($P < 0.05$))

Relative attachment loss						
		mean	N	Standard deviation	Standard error	p value
SRP group	At base Line	3.49	10	0.357	0.113	0.958
	After 3 months	3.14	10	0.464	0.147	0.498
FMD group	At base Line	3.49	10	0.268	0.084	1
	After 3 months	2.94	10	0.362	0.114	0.07

Table 3: Comparative analysis of both the groups for Plaque index (statistically significant ($P < 0.05$))

plaque index						
		mean	N	Standard deviation	Standard error	p value
SRP group	At base Line	2.64	10	0.151	0.047	0.001
	After 3 months	2.38	10	0.166	0.052	0.001
FMD group	At base Line	2.68	10	0.114	0.036	0.9
	After 3 months	2.2	10	0.078	0.024	0

Table 4: Comparative analysis of both the groups for Gingival index (statistically significant ($P < 0.05$))

Gingival index						
		mean	N	Standard deviation	Standard error	p value
SRP group	At base Line	1.63	10	0.114	0.036	0.057
	After 3 months	1.22	10	0.139	0.044	0
FMD group	At base Line	1.63	10	0.114	0.036	1
	After 3 months	1.21	10	0.144	0.045	0

Table 5: Comparative analysis between SRP and FMD groups of OIDP and OHQoL scores

Questionnaire and Group		T1	T2
OIDP			
	SRP		
	Median	10	4
	mean	22	25
	FMD		
	Median	9.5	8
	mean	17.7	19
p		0.8	0.74
OHQoL			
	SRP		
	Median	54	58
	mean	53.2	55
	FMD		
	Median	52	60
	mean	48	55.8
p		0.1	1

DISCUSSION

Non-surgical periodontal treatment is still the main pillar of management plan for patients with chronic periodontitis. In patients with advanced periodontitis, this results in clinical reduction of pocket depths, gain of clinical attachment levels and reduction in bleeding scores in both moderate and deep pockets.^{17,18} Several studies have been performed to compare the effect of this new modality of non-surgical therapy to the standard quadrant scaling and root planing treatment strategy. However, the results appear to be contradictory. Early studies by the Leuven group showed significant clinical and microbial improvements but advance studies show almost no

difference between the new approach of FMD and traditional quadrant debridement. SRP requires a long time duration to be completed, it can have low rates of compliance, and it can be expensive are the disadvantages of it. On the other way, the concept of FMD has microbiologic improvements and no disadvantages or the patient's risk. The FMD concept has generated great enthusiasm over the last several years as it has many advantages. FMD greatly reduces both the number of sessions in the dental operatory and the treatment time. There is limited risk of intraoral cross-infections among treated and untreated sites due to shorter working time.¹⁹

Patients treated by FMD showed a better OHRQL in a short time duration as compare with patients treated by SRP. Both groups presented similar OHRQL results at T1 and T2 in the present study. The OHQoL questionnaire was selected as it can provide data about health or disease status (structure/ function/activity/participation) of the patient and OIDP questionnaire only assesses the negative aspects (disease preventing/dysfunction/failure) of the patient. Mean OHQoL scores in present study 90 days after treatment were 55.8 in the FMD group and 55 in the SRP group. systematic reviews have indicated that periodontal therapy by SRP and FMD lead to similar clinical results, with an improvement in clinical symptoms of periodontitis.^{20,21} The questionnaires used to assess oral health-related quality of life don't assess quality of life perfectly as defined by the World Health Organization. Vandekerckhove *et al.*³¹ reported eight months' follow up of the Quirynen *et al.*¹ study. Greater reduction in probing depth was reported for the FMD group in initially. Results of the present study showed no differences between treatment modalities. So, further studies in other populations may accord to validating these results. The results of this study are helpful to improve the awareness among the practitioners and the general public regarding the importance of maintaining good oral health on quality of life.

CONCLUSION

The present study denotes that either SRP or FMD show an improvement in periodontal clinical parameters, reflecting an improvement in OHRQL, with no differences between both the treatment strategies. Quality of life is a point of interest and should be further studied instead of positive results. Development of more effective questionnaires for even specific results should be focused in future. Finally, the concomitant delivery of high-quality periodontal health care and reduction in treatment cost is a noticeable challenge, but the FMD technique, which makes it possible to optimize the treatment duration, could contribute to a reduction in treatment cost and could thus facilitate patient care.

CONFLICT OF INTEREST

No potential academic conflict of interest relevant to the above article was reported.

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