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Research Article

PERIODONTAL DRESSING, AS AN ADJUNCT TO SCALING AND ROOT PLANING: A RANDOMIZED CONTROLLED CLINICAL PILOT STUDY

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Adjunctive treatment; Chronic periodontitis; Periodontal dressing; Scaling and root planing.

A B S T R A C T

Aim: The aim of the current pilot study was to compare the clinical efficacy of periodontal dressing, as an adjunct to scaling and root planing (SRP), with SRP alone in patients with chronic periodontitis.

Method: In this randomized, pilot clinical trial design, 24 patients with chronic generalized periodontitis were included. The study population were randomly assigned to one of two groups. Group I consisted of 12 individuals (8 males and 4 females; mean age: 42.75 years) who underwent scaling and root planing along with application of periodontal dressing. Group II consisted of 12 individuals (7 males and 5 females; mean age: 40.83 years) who underwent scaling and root planing. Clinical parameters, including site-specific plaque index (PI), gingival index (GI), probing depth, and clinical attachment level (CAL) were recorded at baseline (before SRP) and after 1 month.

Results: There were no significant differences between groups I and II in baseline scores of PI, GI, PD and CAL. Both the groups showed statistically significant reduction in PI, GI, PD and CAL values from baseline to follow-up visits at 30 days. On inter group comparison a significant difference with respect to reduction in PI score in group I (periodontal dressing group) compared with group II (SRP group) was observed.

Conclusion: Within limitations of the study, no additional benefit of periodontal dressing in improving clinical parameters was found when applied as an adjunct to SRP.

INTRODUCTION

Scaling and root planing (SRP) coupled with meticulous plaque control by the patient forms the foundation of periodontal therapy. However, unfortunately the oral cavity is continuously exposed to a festering environment that might interfere with the formation or maturation of a new connective tissue attachment, thus affecting the desired outcome of scaling and root planing procedures. Moreover, it constantly undergoes mechanical, thermal and chemical insult that may lead to treatment failure. As a preventive measure, use of periodontal dressing has been recommended by a number of researchers to isolate and guard the gingival sulcus against outer bacterial insult.

It is implied that periodontal dressings protect the area of wound healing from fibrinolytically active saliva, food impaction and trauma after scaling and root planing or periodontal surgery[1]. Dressings can stabilize the fragile attachment between the soft tissues and the root surface, especially in the earlier phases of wound healing[2].

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Furthermore, periodontal dressing can protect and stabilize the blood clot against internal and/ or external forces in function, thereby, resulting in better cell migration[3]. Recently, periodontal dressing has been placed after non-surgical scaling and root planing with an intention of applying pressure to the treated area. This not only allows the tissue to adapt to underlying structure, providing more stability but also prevents colonization of unwanted bacteria[4-6]. These studies have demonstrated promising results. However, the effectiveness of the application of periodontal dressing following SRP remains to be concluded.

Recently, a novel periodontal dressing and gum solution (Professional PerioCream®, bonyf, Liechtenstein, Europe) has been introduced to isolate and manage gingiva following SRP treatment. The product is used in two phases, post scaling and root planing. Application of the product is initiated by the clinician (Phase one) and completed by the patient (Phase two). Phase one kit comprises of periodontal paste dressing, contained in pre-filled syringes. Phase two is a take home patient kit containing 10 small effervescent tablets, to be used as a brushing solution. (Fig: I)

To date, and to the best knowledge of the authors, no study has evaluated the efficacy of PerioCream as an adjunct to SRP in

treatment of periodontitis. Thus, the aim of the current pilot study was to compare the clinical efficacy of application of periodontal dressing, as an adjunct to scaling and root planing (SRP), with SRP alone in patients with chronic periodontitis.

MATERIALS AND METHODS

Study Population

A total of 24 patients (twelve males and eight females, aged 32 to 56 years; mean age: 42.4 years) with chronic generalized periodontitis were recruited from Outpatient Department of Periodontology, Faculty of Dental Sciences, Ramaiah University of Applied Sciences, Bengaluru from March,2016 to May,2017. The mean number of teeth was 23.4 (third molars were excluded). The study was accepted by the Ethics Committee of the University. Written informed consent was obtained from all participants enrolled into the study.

Inclusion and Exclusion Criteria

After taking a detailed medical history and initial clinical and radiologic examination, systemically healthy individuals with previously untreated chronic periodontitis and ≥ 20 teeth were selected. Clinical parameters for inclusion were: i) probing depth 3-5 mm; and ii) clinical attachment loss ≥ 3mm. Exclusion criteria were: i) use of antibiotics and anti-inflammatory drugs in previous 6 months; ii) individuals with orthodontic appliances or prosthetic appliances; iii) alcoholism; iv) smokers or users of tobacco in any form; and v) pregnant or lactating females.

Study Design and Treatment Protocol

The present study was a 1 month, randomized, single centre, investigator-blind, parallel-designed, pilot clinical trial. It was an interventional, prospective study. Sixty seven individuals were assessed for eligibility; of them, 24 individuals met inclusion criteria and were randomly assigned to one of two groups using random allocation concealment.

Group I consisted of 12 individuals (8 males and 4 females; mean age: 42.75 years) who underwent scaling and root planing along followed by application of periodontal dressing.

Group II consisted of 12 individuals (7 males and 5 females; mean age: 40.83 years) who underwent scaling and root planing. Scaling and root planing was performed for both the groups. In addition to SRP, PerioCream (periodontal dressing) was used in group I patients.

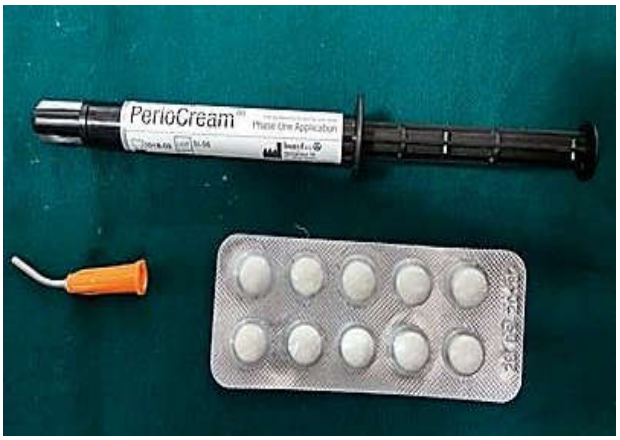

Fig I PerioCream kit with periodontal paste dressing and effervescent tablets

PerioCream has two phases of treatment. The first phase consists of application of the paste dressing following SRP, by the clinician. It dissolves naturally, within 3-4 hours (Fig: I, II & III). In the second phase of the treatment, patients were supplied with the take home kit for brushing. Each kit contains 10 small effervescent tablets (1 tablet per day for 10 days). One tablet is to be dissolved in 15ml of lukewarm water in a container, provided along with the kit, to create a brushing solution. Patients were instructed to brush using a soft bristled toothbrush by immersing it into the solution, for 2-3 minutes. They were advised to not use any other toothpaste when using the solution.

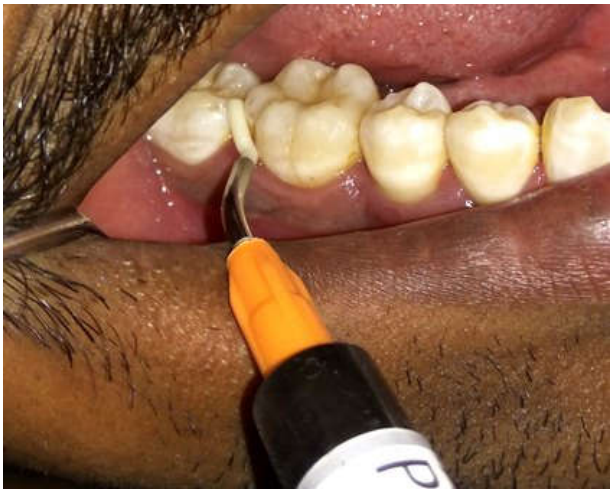

Fig II Pre filled syringe containing periodontal paste dressing

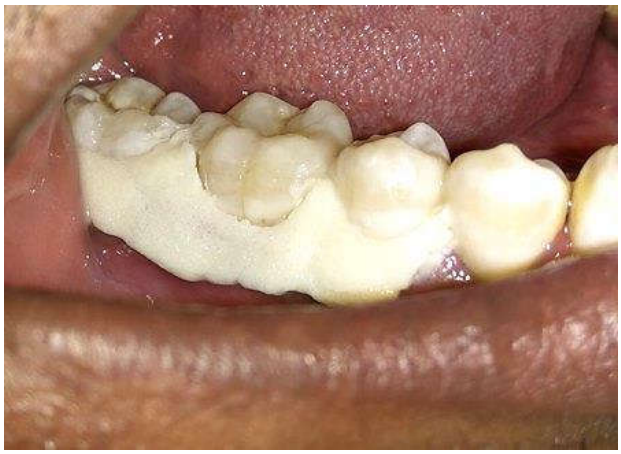

Fig III Post application of dressing

Clinical parameters, including site-specific plaque index (PI) (7), gingival index (GI) (8), probing depth, and clinical attachment level (CAL) were recorded at baseline (before SRP) and after 1 month. A custom-made acrylic stent and UNC-15 probe were used to standardize the measurement of PD and CAL. Clinical attachment level was calculated by measuring the distance from the stent (apical extent) to the base of the pocket minus the distance from the stent to the cementoenamel junction. A single clinician provided treatment to both groups, and another examiner, who was masked to the type of treatment recorded all pre and post-treatment clinical measurements.

Assessment of the product was performed through two sets of written questionnaire, filled by the patients. The first set was answered after application of the paste dressing (after phase 1). Patients were recalled at 11th day, after completion of phase 2.

At this stage, patients were provided with second set of questionnaire. It took into account the general data (name, age, sex, oral hygiene practices, and so forth). In addition, the survey included questions related to the side effects (allergic reactions, unpleasant taste or smell, injury to oral mucosa) of the paste dressing and brushing solution, experienced by patients during the study.

Statistical analyses

The study data was analysed using SPSS (Statistical Package for Social Sciences) software V.22, IBM Corp.The frequency distribution was expressed in terms of number & percentage for categorical variables. Mean & SD were used for continuous variables. The clinical parameters were compared between the groups using Student Unpaired t test between 02 study groups at baseline & 1 month follow-up periods.Student paired t test was used to compare the mean difference for various clinical parameters between baseline and 1month follow-up period within same groups.The level of significance (P-Value) was set at P<0.05.

RESULTS

None of the patients from the study population reported of any allergic reaction, unpleasant taste or smell and any other injury to oral mucosa, during both the phases of treatment.

Table I presents demographic data of the study population. There were no statistically significant differences in mean age and sex of individuals in the two groups.

Table I Comparison of demographic characteristics between 02 groups

Variables	Categories	Group 1		Group 2		P-value
		n	%	n	%	
Gender	Males	7	58.3%	8	66.7%	0.67[a]
	Females	5	41.7%	4	33.3%	
Age	Mean & SD	40.8	7.3	42.8	7.4	0.53[b]

Table II shows comparison of mean values of PI, GI, PD and CAL between 02 groups at baseline level. There were no significant differences between groups I and II in baseline scores of PI, GI, PD and CAL.

Table II Comparison of mean values of different study parameters between 02 groups at Baseline level using Student unpaired t test

Variables	Group	N	Mean	SD	S.E.M	Mean Diff	t	P-Value
PI	Group 1	12	2.12	0.3	0.1	-0.10	-0.870	0.39
	Group 2	12	2.22	0.3	0.1			
GI	Group 1	12	2.07	0.2	0.1	-0.06	-0.825	0.42
	Group 2	12	2.14	0.1	0.0			
PD	Group 1	12	7.25	1.6	0.5	0.08	0.120	0.91
	Group 2	12	7.17	1.8	0.5			
CAL	Group 1	12	7.25	2.3	0.7	-0.08	-0.092	0.93
	Group 2	12	7.33	2.1	0.6			

Table III and IV presents comparison of mean values of PI, GI, PD and CAL between baseline and 30th day for Group I and II respectively. Both the groups showed gradual decrease in PI, GI, PD and CAL values from baseline to follow-up visits at 30 days. Statistically significant reduction in all the parameters was observed for groups I and II.

Table V presents inter-group comparison of mean values of clinical parameters recorded.

There was a significant difference with respect to reduction in PI score in group I (periodontal dressing group) compared with group II (SRP group). However, no significant reduction in GI, PD and CAL scores were observed in comparison between 2 groups.

Table III Comparison of mean values of different study parameters between Baseline & 30th day follow-up period in Group 1 using Student paired t test

Variables	Group	N	Mean	SD	S.E.M	Mean Diff	t	P-Value
PI	Baseline	12	2.12	0.3	0.1	0.71	16.832	<0.001*
	30th Day	12	1.42	0.2	0.1			
GI	Baseline	12	2.07	0.2	0.1	0.70	14.858	<0.001*
	30th Day	12	1.37	0.2	0.1			
PD	Baseline	12	7.25	1.6	0.5	1.00	4.690	0.001*
	30th Day	12	6.25	1.5	0.4			
CAL	Baseline	12	7.25	2.3	0.7	0.83	3.079	0.01*
	30th Day	12	6.42	2.1	0.6			

Table IV Comparison of mean values of different study parameters between Baseline &30th Day follow-up period in Group 2 using Student paired t test

Variables	Group	N	Mean	SD	S.E.M	Mean Diff	t	P-Value
PI	Baseline	12	2.22	0.3	0.1	0.53	18.201	<0.001*
	30th Day	12	1.69	0.2	0.1			
GI	Baseline	12	2.14	0.1	0.0	0.60	17.580	<0.001*
	30th Day	12	1.53	0.2	0.1			
PD	Baseline	12	7.17	1.8	0.5	1.00	5.745	<0.001*
	30th Day	12	6.17	1.7	0.5			
CAL	Baseline	12	7.33	2.1	0.6	1.00	5.745	<0.001*
	30th Day	12	6.33	2.1	0.6			

Table V Comparison of mean values of different study parameters between 02 groups at 30th Day Post Rx follow-up period using Student unpaired t test

Variables	Group	N	Mean	SD	S.E.M	Mean Diff	t	P-Value
PI	Group 1	12	1.42	0.2	0.1	-0.27	-2.904	0.008*
	Group 2	12	1.69	0.2	0.1			
GI	Group 1	12	1.37	0.2	0.1	-0.16	-1.898	0.07
	Group 2	12	1.53	0.2	0.1			
PD	Group 1	12	6.25	1.5	0.4	0.08	0.126	0.90
	Group 2	12	6.17	1.7	0.5			
CAL	Group 1	12	6.42	2.1	0.6	0.08	0.098	0.92
	Group 2	12	6.33	2.1	0.6			

DISCUSSION

The current study was designed to determine the efficacy of periodontal dressing, as an adjunctive treatment modality to SRP, in reducing plaque scores, gingival inflammation, probing pocket depth and clinical attachment level in patients with chronic periodontitis. PerioCream kit used in the present study includes a periodontal paste dressing and a brushing solution. The periodontal paste dressing is composed of calcium/sodium PVM/MA copolymer with cellulose gum, olive oil and nitradine components.

Periodontal dressing, after non- surgical periodontal therapy, is mainly applied with a rationale of protection and stabilization of the blood clot, to ensure a proper wound healing[4,9]. Besides, it could also prevent future bacterial infiltration into the healing site[10]. Other potential benefits reported are significant reduction of root sensitivity and deposition of plaque within the treated site[11]. In the present study, significant reduction of PI, GI, PD and CAL scores were found in both the groups. Inter group comparison revealed no statistically significant reduction in GI, PD and CAL, indicating that periodontal dressing does not have any additional benefit. This was in accordance with Jentsch *et al*[11]. However, statistically significant greater reduction was observed only in PI scores in

PerioCream when compared with SRP group alone.Besides serving as a mechanical barrier, this reduction can also be attributed to the presence of nitradine in the periodontal dressing. Nitradine has been reported to exhibit high activity against the formation of dental biofilm[12].

In contrast, Sigusch *et al*[13] and Genovesi *et al*[4] reported a beneficial effect of dressing. They applied periodontal dressings for 3 to 4 or 7 to 8 days in patients with generalised aggressive periodontitis and in chronic periodontitis, respectively, and found favorable clinical results. In these studies, higher attachment gains and PD reduction were found two months after the dressing had been applied. One may speculate that a dressing applied for more than three days facilitates a better clinical outcome. Conversely, clinical data from studies by Stahl *et al*[14] and Jentsch *et al*[1] did not show any positive effect of dressing. Moreover, it has been observed that after 3 to 4 days, dressing was no longer tightly affixed to the tooth and mucosal surfaces[1]. Also, mechanical plaque control by the study population could not be attained in sites with periodontal dressing. Therefore, in the current study periodontal paste dressing was applied only for 3-4 hours, thereafter dissolving naturally, with a primary aim of stabilizing the blood clot. Besides, the application of dressing for a shorter duration enabled the patients to perform plaque control.

In the present study, plaque control was attained immediately the next day after phase 1, which employed tooth brushing along with the solution, prepared from the effervescent tablets, provided in the kit. The active ingredients of these tablets are citric acid and sodium bicarbonate.

Evidences suggest that citric acid (pH 1) nearly removes all debris and bacteria from partly scaled surfaces. It also decalcifies the superficial layers of residual calculus[15]. Sodium bicarbonate has low abrasivity and enhanced plaque removal effectiveness. It is reported to be bactericidal against most periodontal pathogens[16-18]. According to a recent systematic review by Monje *et al*[19]in 2015, it was concluded that "placement of periodontal dressing right after non-surgical mechanical therapy can be beneficial in improving overall short-term clinical outcomes, although more controlled studies are still needed to validate this finding".Thus, the verification regarding the use of periodontal dressing as an adjunct to non-surgical periodontal therapy still remains to be inconclusive.

In our study, inter group comparison did not show any greater reduction in GI, PD and CAL scores with the application of periodontal dressing. This could possibly be due to smaller sample size or shorter follow up period. Further long-term clinical studies with larger sample sizes and microbiological investigations are warranted to confirm findings of this short-term clinical trial.

CONCLUSION

Within limitations of the study, no additional benefit of periodontal dressing in improving clinical parameters was found when applied as an adjunct to SRP. Based on the results obtained from this study, it can be concluded that application of periodontal dressing has no additional positive effects on the results of SRP.

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