

Comparative Evaluation of Turmeric Gel with Chlorhexidine Gel in Chronic Periodontitis Patients: A Randomized Clinical Trial

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Abstract

Objective: This study was done evaluate and compare the clinical effects of subgingival application of turmeric gel and chlorhexidine gel in patients with chronic periodontitis.

Materials and Methods: Thirty female subjects of age group 20 - 55 years were randomly selected for a split-mouth study. In each participant, three teeth with probing depth between 4 mm and 7 mm at three different quadrants were randomly divided to group I (received turmeric gel), group II (received chlorohexidine), group III (received scaling and root planing alone) and follow up done at baseline, 30 days and 45 days.

Results: The results showed a significant reduction with all parameters in group I and group II when compared to group III ($p < 0.05$). However, there is no significant difference between group I and group II. No complication or allergic response was encountered with any of the participants and after 45 days all groups showed a healthy gingiva.

Conclusion: Turmeric gel can be effectively used as an adjunct to scaling and root planning with fewer side effects compared to chlorhexidine and it is more effective than scaling and root planing alone in the treatment of periodontal pockets.

Keywords: *Turmeric Gel; Chlorohexidine; Periodontitis*

Introduction

Periodontal diseases are chronic infectious diseases initiated by a bacterial challenge. Routine comprehensive mechanical debridement of teeth with deep periodontal pockets is difficult to achieve [1]. This may necessitate the adjunctive use of antimicrobial agents either systemically or locally. The systemic administration of antimicrobial agents have several side effects, their local application has received considerable attention [2]. The local drug-delivery system is easy to use, noninvasive and requires less chairside time [3]. Chlorhexidine gel has been found to be a very effective local antimicrobial agent but it has some side effects like brown discoloration of the teeth, oral mucosal erosion, and bitter taste [3-5]. Therefore, there is a need for an alternative medicine that can provide an antimicrobial effect. Turmeric is a common antiseptic used in the traditional system of Indian medicine. Turmeric has properties like anti-inflammatory, antioxi-

dant, antimicrobial, hepatoprotective, immunostimulant, antiseptic, antimutagenic, and it also accelerates wound healing and decreases postoperative pain [6-8].

Aim of the Study

The aim of this research was to evaluate and compare the clinical effects of the subgingival application of turmeric gel and chlorhexidine gel in patients with chronic periodontitis.

Materials and Methods

The study was conducted in Qassim University Female dental Clinics, thirty female subjects of age group 20 - 55 years were randomly selected for a split-mouth study. The study protocol was approved by the Dental Ethics Committee of Dental Research Center at Qassim University.

Inclusion criteria:

- Healthy and cooperative patients.
- Patients who consented to participate.
- Patients with a pocket depth of 4 - 7 mm in three sites.
- Patients with more than or equal to 20 teeth.

Exclusion criteria:

- Patient under antibiotics for the past 1 month.
- Pregnant or lactating women.
- Smokers or allergic patients.
- Patients using mouthwash or underwent periodontal therapy for the past 6 months.
- Patients were allergic to curcumin or chlorohexidine.

Materials

Turmeric gel (Curenex)

1 gm of gel contained 10 mg of Curcuma long extract. Curenex oral gel (Abbott pharmaceuticals pot, Ltd, Mumbai, India).

Chlorohexidine gel (Hexigel)

The gel contained 1% of chlorohexidine per 15 gm of Chlorhexidine gluconate gel (ICPA Health Products Ltd).

Methods

After obtaining the informed consent and recording the clinical parameters were recorded which included: Plaque scores using Plaque Index (PI; Silness and Loe, 1964), Gingivitis using Gingival Index (GI; Loe and Silness, 1963), Probing depth was measured using UNC-15 probe and clinical attachment level was determined by measuring the distance between the base of the pocket and the cemento-enamel junction, followed by scaling and root planning (SRP). In each participant, three teeth with probing depth between 4mm and 7mm at three different quadrants were randomly divided into Group I (received turmeric gel), Group II (received chlorohexidine), Group III (received SRP alone). A Graduated syringe was used to deliver the gels at the selected sites. The syringe was carefully placed into the pocket at least 3 mm below the gingival margin. The drug was delivered gradually as the syringe was moved occlusally. After application, each patient

was instructed to visit the clinic if there were any symptoms of pain, discomfort or irritation at the injected site. In the second visit (30 days) and third visit (45 days), clinical parameters were recorded. Clinical parameters were analyzed using the Statistical Package for Social Sciences version 17.0 (SPSS Inc., Chicago, IL, USA). A paired t-test was used to analyze intragroup comparison. While ANOVA and Scheffe’s post-hoc test was used to analyze intergroup comparisons. The level of significance was set at $P < .05$ for all tests.

Results

Ninety sites from thirty patients were involved in this study. In Group I thirty sites treated with turmeric gel, Group II thirty sites treated with chlorhexidine gel and in Group III thirty sites treated with SRP alone. The results showed a significant reduction with all parameters in Group I and Group II when compared to Group III. However, there was no significant difference between Group I and Group II. No complication or allergic response was encountered with any of the participants and after 45 days all groups showed a healing process (Table 1-4).

Discussion

Mechanical debridement is a good way to prevent/limit the progression of periodontitis. Although, it has a limited effect in deeper pockets. Therefore reduction of probing depth, attachment loss and bleeding on probing will be limited [1]. However, subgingival anti-

Clinical Parameters	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
Plaque Index at baseline	Group I (Turmeric)	Group II (Chlorohexidine)	-.100	.161	.825
		Group III (SRP)	.100	.161	.825
	Group II (Chlorohexidine)	Group I (Turmeric)	.100	.161	.825
		Group III (SRP)	.200	.161	.465
	Group III (SRP)	Group I (Turmeric)	-.100	.161	.825
		Group II (Chlorohexidine)	-.200	.161	.465
Plaque Index at 30 days	Group I (Turmeric)	Group II (Chlorohexidine)	.067	.143	.897
		Group III (SRP)	-1.200	.143	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	-.067	.143	.897
		Group III (SRP)	-1.267	.143	.000*
	Group III (SRP)	Group I (Turmeric)	1.200	.143	.000*
		Group II (Chlorohexidine)	1.267	.143	.000*
Plaque Index at 45 days	Group I (Turmeric)	Group II (Chlorohexidine)	.000	.085	1.000
		Group III (SRP)	-1.133	.085	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.000	.085	1.000
		Group III (SRP)	-1.133	.085	.000*
	Group III (SRP)	Group I (Turmeric)	1.133	.085	.000*
		Group II (Chlorohexidine)	1.133	.085	.000*

Table 1: Intragroup comparison of plaque index.

Clinical Parameters	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
Gingival Index at baseline	Group I (Turmeric)	Group II (Chlorohexidine)	.233	.163	.365
		Group III (SRP)	.267	.163	.269
	Group II (Chlorohexidine)	Group I (Turmeric)	-.233	.163	.365
		Group III (SRP)	.033	.163	.979
	Group III (SRP)	Group I (Turmeric)	-.267	.163	.269
		Group II (Chlorohexidine)	-.033	.163	.979
Gingival Index at 30 days	Group I (Turmeric)	Group II (Chlorohexidine)	.100	.122	.717
		Group III (SRP)	-.800	.122	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	-.100	.122	.717
		Group III (SRP)	-.900	.122	.000*
	Group III (SRP)	Group I (Turmeric)	.800	.122	.000*
		Group II (Chlorohexidine)	.900	.122	.000*
Gingival Index at 45 days	Group I (Turmeric)	Group II (Chlorohexidine)	.000	.067	1.000
		Group III (SRP)	-.733	.067	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.000	.067	1.000
		Group III (SRP)	-.733	.067	.000*
	Group III (SRP)	Group I (Turmeric)	.733	.067	.000*
		Group II (Chlorohexidine)	.733	.067	.000*

Table 2: Intragroup comparison of gingival index.

Clinical Parameters	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
Pocket Depth at baseline	Group I (Turmeric)	Group II (Chlorohexidine)	.100	.271	.934
		Group III (SRP)	-.267	.271	.619
	Group II (Chlorohexidine)	Group I (Turmeric)	-.100	.271	.934
		Group III (SRP)	-.367	.271	.405
	Group III (SRP)	Group I (Turmeric)	.267	.271	.619
		Group II (Chlorohexidine)	.367	.271	.405
Pocket Depth at 30 days	Group I (Turmeric)	Group II (Chlorohexidine)	-.200	.201	.611
		Group III (SRP)	-1.300	.201	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.200	.201	.611
		Group III (SRP)	-1.100	.201	.000*
	Group III (SRP)	Group I (Turmeric)	1.300	.201	.000*
		Group II (Chlorohexidine)	1.100	.201	.000*
Pocket Depth at 45 days	Group I (Turmeric)	Group II (Chlorohexidine)	-.033	.131	.968
		Group III (SRP)	-1.333	.131	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.033	.131	.968
		Group III (SRP)	-1.300	.131	.000*
	Group III (SRP)	Group I (Turmeric)	1.333	.131	.000*
		Group II (Chlorohexidine)	1.300	.131	.000*

Table 3: Intragroup comparison of pocket depth.

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Clinical Parameters	(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.
Attachment Loss at base line	Group I (Turmeric)	Group II (Chlorohexidine)	.100	.271	.934
		Group III (SRP)	-.267	.271	.619
	Group II (Chlorohexidine)	Group I (Turmeric)	-.100	.271	.934
		Group III (SRP)	-.367	.271	.405
	Group III (SRP)	Group I (Turmeric)	.267	.271	.619
		Group II (Chlorohexidine)	.367	.271	.405
Attachment Loss at 30 days	Group I (Turmeric)	Group II (Chlorohexidine)	-.133	.180	.760
		Group III (SRP)	-1.100	.180	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.133	.180	.760
		Group III (SRP)	-.967	.180	.000*
	Group III (SRP)	Group I (Turmeric)	1.100	.180	.000*
		Group II (Chlorohexidine)	.967	.180	.000*
Attachment Loss at 45 days	Group I (Turmeric)	Group II (Chlorohexidine)	.000	.080	1.000
		Group III (SRP)	-.700	.080	.000*
	Group II (Chlorohexidine)	Group I (Turmeric)	.000	.080	1.000
		Group III (SRP)	-.700	.080	.000*
	Group III (SRP)	Group I (Turmeric)	.700	.080	.000*
		Group II (Chlorohexidine)	.700	.080	.000*

Table 4: Intragroup comparison of attachment loss.

Microbial agents are commonly used as adjunctive to SRP to overcome the limitation of SRP alone and increase the efficiency of treatment for better clinical outcomes [2]. One of the most common antimicrobial agents is chlorhexidine which is found to be effective in subgingival microbial elimination and plaque inhibition. It is also safe and cost-effective [4,5,9]. But due to some side effects of chlorhexidine like brown discoloration and oral mucosa erosion, the need for an alternative antimicrobial agent increases [10,11]. Turmeric is an analgesic, antimicrobial, anti-inflammatory, antimutagenic and anticoagulant agent, anti-allergic, antioxidant, antiseptic, antispasmodic, appetizer, astringent, cardiovascular, carminative, digestive, and diuretic [6-8]. Turmeric is used lately in dentistry due to its efficiency in reducing bleeding and promote healing of periodontal tissue [12-15]. Many studies found that curcumin mouthwash and gel is comparable to chlorhexidine as an anti-inflammatory antiplaque in patients with gingivitis and chronic periodontitis [16-23]. In this study the results show that when Group I (turmeric gel) and Group III (SRP) were compared there was a considerable improvement in the all clinical parameters in Group I there was a reduction in probing pocket depth and decreasing attachment loss and improvement in plaque and gingival health. This finding because of anti-inflammatory, immunostimulant as well as accelerating wound healing effect of Turmeric gel which is agreed with Behal R., et al. results as well as Jaswal R., et al. [24,25].

Also, there was a progressive change in parameters when Group II and Group III compared. Group II found to be more effective and this is may be caused by the antimicrobial and anti-inflammatory effect of chlorhexidine which has been approved by Kondreddy K., et al. and Vinhilis AH., et al. study [5,11]. However, comparison between group I and II showed similar results in all parameter, these results are supported with Behal R., et al, Jaswal R., et al. study [24,25]. These results confirmed that turmeric gel can be used for treating periodontal disease with adjunction to SRP as same as effective using chlorhexidine in adjunction to SRP. Turmeric has an acceptable taste and biocompatible with no side effects. Although this study introduced a new local drug delivery agent with a promising effect on treating

the periodontal disease. This study has some limitations like small sample size and a shorter period of time for follow up. Thus, there is a need for a longitudinal study with larger sample size.

Conclusion

Turmeric gel can be effectively used as an adjunct to scaling and root planning with fewer side effects compared to chlorhexidine and it is more effective than scaling and root planing alone in the treatment of periodontal pockets.

Conflict of Interest

Authors declare no financial interest or any conflict of interest exists.

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