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## RESEARCH ARTICLE

### USE OF CURCUMIN GEL AS AN ADJUNCT TO SCALING AND ROOT PLANING-A CLINICAL STUDY

\*Dr. Munaza Shafi, Dr. Nawal Khan and Dr. Shahnaz Nabi

Department, Institution to which this study is Associated with: Department of Dentistry,  
SKIMS Medical College, Bemina, Srinagar

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##### \*Corresponding author:

Dr. Munaza Shafi

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#### ABSTRACT

**Introduction:** The aim of the present study was to study the synergistic effects of SRP (Scaling and root planning) and Cur cumin Gel applications in comparison with SRP alone. **Materials and Methods:** Two sites in the contra lateral quadrants having probing pocket depths (PPDs) of  $\geq 5$  mm were selected in thirty patients. Application of cur cumin gel on a single side followed full mouth scaling and root planning (SRP). Evaluation of plaque index (PI), gingival index (GI), PPD and Relative attachment levels (RALs) were done at baseline and after 4 weeks. **Results:** There was a significant improvement in the PI, GI, PPD and RAL for both quadrants treated only with SRP or combination of SRP and Cur cumin in all patients. However, test group presented lower GI, PI, PPD and RAL than the control group at the end of study period. **Conclusion:** Higher reduction in plaque accumulation, gingival index and pocket probing depth was seen with Cur cumin as an adjunct to SRP as compared to SRP alone.

#### INTRODUCTION

Periodontal disease is a chronic inflammatory disease characterized by destruction of the supporting structures of the teeth. The primary etiologic factor of periodontitis is dental plaque and the microorganisms that are present in it. The bio film nature of dental plaque provides a specialized environment for the microorganisms, thereby ensuring its vitality and pathogenicity. The aim of periodontal therapy is to remove the bacterial plaque and all the factors that favors its accumulation. The routine therapeutic modality of periodontitis is scaling and root planning (SRP). This involves the removal of supragingival and sub gingival plaque and calculus, thereby returning the tissues to a state of health (Anitha et al., 2015). Scaling and root planning (SRP) remains the "gold standard" treatment for periodontal diseases against which other treatments are compared. However, after nonsurgical therapy, several deep periodontal pockets may persist and in such cases, the treatment consists of surgical procedures (Unsal, 1994). Since the systemic antibiotics therapy has various disadvantages such as the development of resistant bacteria and also requires higher dosage to attain required gingival crevicular fluid concentration at the target site, this led to use of local drug (Amitha, 2011). Local delivery of chemotherapeutic agents into the pockets via a syringe or irrigating device has been shown to be effective against sub gingival flora (Soskolne, 1997). The clinical efficacy of a local drug delivered is to be evaluated primarily

by using several outcome measures: Reduced probing depths (PD), increased clinical attachment levels (CALs), decreased bleeding on probing, and reduced disease progression (Greenstein, 2000). In order to accomplish this, local application of pharmacological agents must fulfill three criteria:

- The medication must reach the intended site of action
- Remain at an adequate concentration
- Last for a sufficient duration of time (Greenstein, 2000)

Cur cumin more commonly known as "Haldi" in its various forms is a very auspicious element in many religious ceremonies in Hindu families. Cur cumin possesses anti-inflammatory, antioxidant, antimicrobial properties along with its hepato-protective, immunostimulant, antiseptic, anti-mutagenic, and many more properties. It is for this concern that promotion of cur cumin in dental terrain would prove beneficial (Pragati, 2009). In this study, an attempt has been made to evaluate the efficacy of gel containing cur cumin as an adjunct to SRP.

**Aim:** To evaluate the efficacy of sub gingival application of cur cumin gel as an adjunct to SRP in the treatment of chronic periodontitis

## MATERIALS AND METHODS

Patients diagnosed with chronic periodontitis aged greater than 35 years with at least one tooth with probing pocket depth (PPD)  $\geq 5$  mm in contralateral quadrant were included in this study. Patients with periodontal treatment within the last 6 months, pregnancy, smoking, allergy to the dyes, and systemic diseases that could influence the outcome of therapy and ingestion of systemic antibiotics within the last 6 months were

## RESULTS

Periodontal parameters at baseline were similar in both groups (Table 1). When compared at baseline and at final follow-up, both of the treatments showed statistically significant reduction in PI, gingival index, pocket probing depth and RAL (Tables 2 and 3). Intergroup analysis showed statistically significant difference with respect to PI ( $<0.001$ ), Gingival index ( $<0.001$ ) and pocket probing depth (0.006) in favour of the test group.

**Table 1. Baseline values of test and control**

| Clinical parameters | Mean $\pm$ SD    |                  | P     |
|---------------------|------------------|------------------|-------|
|                     | Test             | Control          |       |
| PI                  | 2.59 $\pm$ 0.496 | 2.75 $\pm$ 0.43  | 0.171 |
| GI                  | 3.01 $\pm$ 0.47  | 3.01 $\pm$ 0.414 | 1     |
| PPD                 | 4.51 $\pm$ 0.569 | 4.51 $\pm$ 0.505 | 1     |
| RAL                 | 3.19 $\pm$ 2.005 | 3.75 $\pm$ 1.692 | 0.242 |

**Table 2. Results in test given at different time intervals (Baseline and 4 Weeks)**

| Clinical parameters | Baseline         | 4 weeks          | P        |
|---------------------|------------------|------------------|----------|
| PI                  | 2.6 $\pm$ 0.498  | 0.37 $\pm$ 0.556 | $<0.001$ |
| GI                  | 3.03 $\pm$ 0.49  | 0.83 $\pm$ 0.379 | $<0.001$ |
| PPD                 | 4.53 $\pm$ 0.871 | 2.67 $\pm$ 0.479 | $<0.001$ |
| RAL                 | 3.2 $\pm$ 2.007  | 1.97 $\pm$ 1.273 | $<0.001$ |

**Table 3. Results in control given at different time intervals (Baseline and 4 Weeks)**

| Clinical parameters | Baseline         | 4 Weeks          | P        |
|---------------------|------------------|------------------|----------|
| PI                  | 2.75 $\pm$ 0.42  | 1.25 $\pm$ 0.45  | $<0.001$ |
| GI                  | 3.05 $\pm$ 0.41  | 1.65 $\pm$ 0.479 | $<0.001$ |
| PPD                 | 4.49 $\pm$ 0.505 | 3.32 $\pm$ 0.884 | $<0.001$ |
| RAL                 | 3.75 $\pm$ 1.690 | 3 $\pm$ 1.38     | 0.002    |

**Table 4. Difference from baseline to final follow-up (4 Weeks)**

| Clinical parameters | Test            | Control         | P        |
|---------------------|-----------------|-----------------|----------|
| I                   | 2.19 $\pm$ 0.64 | 1.4 $\pm$ 0.56  | $<0.001$ |
| GI                  | 2.1 $\pm$ 0.59  | 1.35 $\pm$ 0.72 | $<0.001$ |
| PPD                 | 1.85 $\pm$ 0.86 | 1.19 $\pm$ 0.93 | 0.006    |
| RAL                 | 1.19 $\pm$ 1.04 | 0.77 $\pm$ 1.22 | 0.117    |

The results of the present study indicated the efficacy of the curcumin gel in improving the PI, Gingival index and probing pocket depth in participants with chronic periodontitis. There was statistically significant improvement in the RAL, but on comparison with the control group, the improvement was not statistically significant.

The reduction in the PI can be contributed to its antibiofilm activity, as suggested by Chusri *et al.* (2012) and Savita *et al.* Savita *et al.* claimed that curcumin inhibits the production of biofilm and disperses the biofilm made by many microorganisms (Savita, 2015). The reduction in gingival index and pocket probing depth can be attributed to curcumin's anti-inflammatory and wound healing capacity as suggested by Rai *et al.* Rai *et al.* suggested that curcumin may inhibit bacterial cell proliferation by inhibiting the assembly excluded from the study. Of 30 patients, sixty sites were selected for the study. Two sites were identified for the study in each patient and were randomly allocated:

- **Group I (control)** - Only scaling and root planning was done at the baseline visit
- **Group II (test)** - Scaling and root planning was followed by local application of curcumin at the baseline visit.

All the clinical parameters like Plaque Index (PI) (Sinless and Loe, 1964), Gingival Index (GI) (Loe and Sinless, 1963), PPD, RAL were recorded at baseline and after 4 weeks.

The RAL when compared at 4 weeks follow-up and baseline had increased in both test and control groups; although it was higher in test group, it was not statistically significant with  $P = 0.117$  (Table 4).

## DISCUSSION

The primary objective of periodontal therapy is to reduce the microbial load, thereby leading to an improvement in the clinical parameters. SRP remains the gold standard of periodontal therapy, with numerous other agents being currently used as adjunctive therapeutic modalities. Despite the availability of a wide range of antimicrobial agents for clinical use, development of new antimicrobial agents remains important and many studies have been aiming at the discovery and development of new antimicrobial agents<sup>(7)</sup> The combination of microorganisms and inflammatory response is the cause of many diseases, including periodontitis, for which compounds having a dual anti-inflammatory and antimicrobial activity may be desirable therapeutic agents<sup>(8)</sup> There has been an essential change in concepts of the periodontal disease treatments over the past three decades. For instance, nowadays, local delivery of antimicrobials, host modulators, and laser has many applications in periodontal therapy. Therefore, the aim of this study was to investigate the efficacy of the adjunctive method of using curcumin gel following a conventional SRP treatment.

Turmeric in mouthwash form was used by Bhandari and Shankwalkar (Bhandari, 1980) whereas turmeric in gel form was used in this study. Antimicrobial activity of turmeric was observed by Mun *et al.* (2014) and Hamed *et al.* (2013) Cur cumin possess wound healing and anti-inflammatory property by virtue of which it reduces the inflammatory mediators generated via arachidonic acid pathway and thereby reduced inflammatory edema and vascular engorgement of connective tissue (Nagpal, 2013). Cur cumin exhibits its anti-inflammatory effect by increasing cortisone production by adrenal glands and by decreasing histamine levels and also by inhibiting the synthesis of dynamics of FtsZ (a bacterial protofilament), prostaglandulins and neutrophil function. Cur cumin is half as effective in chronic inflammation as it is effective as cortisone or phenylbutazones in acute inflammation (Nagpal, 2013). This study aimed at evaluating the effectiveness of cur cumin gel when used along with SRP as a topical gel by comparing with only SRP which polymerizes to form a Z-ring at the miscall that orchestrates bacterial cell division. RAL failed to show statistically significant improvements which can be attributed to the short duration of the study (4 weeks) and small sample size.

### Conclusion

Based on the findings of the present study, treatment with curcumin gel as an adjunct to SRP is equally effective and may improve periodontal health and microbiological indices compared to SRP alone.

There are no conflicts of interest.

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