THE COMPARITIVE EVALUATION OF XANTHAN GEL WITH CHLORHEXIDINE (CHLOSITE) IN SMOKERS & NON SMOKERS - A Clinical & Microbiological Study.

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INTRODUCTION

Traditionally periodontal disease therapy has been directed to altering the periodontal environment to one that is less conducive to the retention of bacterial plaque in the vicinity of gingival tissues. With the increasing awareness of the bacterial etiology of periodontal diseases [1-2], and in particular the hypothesis that specific bacteria are involved [3], a more direct approach, using antibacterial agents has become an integral part of the therapeutic armamentarium. Recently a new sustained local drug delivery chlorhexidine with xanthan gel, Chlosite (1.5% of chlorhexidine in 0.5ml of xanthan gel) has been introduced. Therefore it was deemed important to evaluate the efficacy of this drug clinically and microbiologically in the treatment of chronic periodontitis smoker and non-smoker patients.

OBJECTIVES OF THIS STUDY ARE:

To determine the effect of chlosite as a monotherapy, chlosite compared to scaling and root planning,,chlosite with scaling and root planing (combination therapy) and to determine the efficacy of chlosite on periodontopathogens.

INCLUSION AND EXCLUSION CRITERIA:

Patients who were diagnosed as suffering from chronic generalized periodontitis (AAP-1999). Patient selected should have periodontal pocket measuring 5-7mm in different quadrants of the mouth on clinical examination and radiographic evidence of bone loss. Patients who had not received any periodontal therapy for past 6 months Patients free from any systemic diseases. Pregnant women and nursing mothers. Patients with known hypersensitivity to chlorhexidine. Teeth with furcation involvement were excluded.

CLINICAL PARAMETERS:

Prior to scaling and root planing each selected site was subjected to assessment of the following clinical parameter.Plaque index (Silness and Loe, 1964) [5], Bleeding index (Ainamo and Bay, 1975)[6],Gingival index (Loe and Silness, 1963) [7],Relative attachment level using UNC-15 periodontal probe ,Sub-gingival microbiological plaque samples.The clinical parameters were assessed on day '0', 30th and 90th day. Relative attachment level was assessed only on '0' day and 90th day and microbiological samples were collected on the '0' and 30th day only.

SUBGINGIVAL MICROBIOLOGICAL SAMPLES:

Subgingival microbial examination was performed at baseline and on 30th day. After removing supragingival plaque, two fine endodontic paper points were inserted to the depth of each periodontal pocket for 10 sec and then transferred to 1ml Thioglycollate broth (transport medium) and sealed tightly to avoid contamination. Samples were processed within 2 days of collection. Once it was received in the laboratory the sample was mixed thoroughly and 5 microliter each was inoculated using sterile loop onto the following mediums: Enriched blood agar (Porphyromonas gingivalis),Brewers's anaerobic agar (Fusobacterium nucleatum), Bacteroides bile esculin agar (Tannerella forsythensis) [8].

PROCEDURAL STEPS FOR CHLOSITE ADMINISTRATION:

Chlosite was provided as a single dose syringe with 0.5 ml of xanthan gel, which contains a mixture of chlorhexidine digluconate and chlorhexidine dihydrochloride, in a ratio of 1: 2. The gel was administered in experimental site A (scaling and root planing plus Chlosite) and experimental site B (Chlosite only) on '0' day. The periodontal pocket was washed with distilled water and then dried with paper points before sub gingival administration of Chlosite. Subgingival administration was accomplished by inserting the single dose syringe to the base of the periodontal pocket first and then working the way up, until the gingival margin. Chlosite undergoes a progressive process of imbibition, and gets physically removed from the application site within 10-30 days, making a follow up visit for removal of the material unnecessary. After the treatment, patients were instructed to avoid eating hard, crunchy or sticky foods for one week and postpone brushing for 12 hours period, as well as touching the treated areas. Patients should also postpone the use of interproximal cleaning devices for 10 days.

RESULTS: A total number of 141 sites from 6 patients (67 sites from 3 non-smoker patients and 74 sites from 3 smoker patients) with periodontal pockets measuring 5-7 mm in different quadrants of mouth were selected, using clinical and microbiological parameters. At selected sites the clinical parameters were assessed and microbiological plaque samples were taken.

DISCUSSION

Chlorhexidine (CHX) is a widely used broad-spectrum antimicrobial agent to inhibit bacterial growth and, thus, an adjunctive mean to control oral hygiene in patients with periodontal disease. Attempts to prolong the subgingival application of chlorhexidine by incorporation of an antiseptic in a gel have not resulted in improved treatment outcomes[11]. However with the use of Chlosite effective subgingival concentration of chlorhexidine can be maintained for several days. The physical properties of xanthan render it an optimum substrate for the formation of a stable gel that is easily extruded from a syringe needle; therefore xanthan appears to be the best biocompatible vehicle for clinical application[12].

A)PLAQUE INDEX:

In non-smokers, the mean reduction in plaque index from '0' to 90th day was 83.3% and 84.6% for SRP and SRP + CHL respectively. However the difference in plaque index at '0' to 90th day between the two groups was statistically not significant. These findings were similar to the findings of **Azmak et al** [13] who studied the effect of subgingival controlled release delivery of 2.5 mg of chlorhexidine chip on clinical parameters of chronic periodontitis patients, in patients receiving SRP + chlorhexidine and SRP alone groups. Mean reduction in plaque score from baseline to 90th day for CHL was 58.3%, which was statistically highly significant. In smokers, the mean reduction in plaque score from '0' to 90th day was 46.2%, 66.7% and 14.3% in SRP, SRP + CHL and CHL respectively which was statistically highly significant in SRP and SRP + CHL and significant in relation to CHL. On comparison of non-smokers Vs smokers the mean difference of plaque score between '0' to 90th day for SRP and CHL was statistically significant and for SRP + CHL it was statistically not significant.

B) BLEEDING INDEX:

In non-smokers, the mean reduction in bleeding index from '0' to 90th day was 100% for SRP and SRP + CHL respectively. However the difference in bleeding index at '0' to 90th day between the two groups was statistically significant. These findings are similar to the findings of Pennuti et al [14] who studied the efficacy of 0.5% chlorhexidine gel on the control of gingivitis in mentally handicapped patients over a period of 8 weeks. In smokers, the mean reduction in bleeding score from '0' to 90th day was 100% in SRP, SRP + CHL and CHL, and it was statistically highly significant in all the above-mentioned three treatment modalities. On comparison of non-smokers Vs smokers, the mean difference of bleeding score between '0' to 90th day was statistically significant for SRP and statistically not significant for SRP + CHL and CHL.

C) GINGIVAL INDEX:

In non-smokers, the mean reduction in gingival score from '0' to 90th day was 88.9% and 85.7% for SRP and SRP + CHL respectively. These findings were similar to that of Unsal et al [15] who studied the clinical effects of subgingival placement of 1% chlorhexidine gel in adult periodontitis patients over duration of 12 weeks. There was 54.6% mean reduction in gingival score from baseline to 90th day, which was statistically highly significant. In smokers, the mean reduction in gingival score from '0' to 90th day was 84.5%, 63.6% and 66.7% which was highly significant for SRP and SRP + CHL, whereas significant for CHL. On comparison of non-smokers Vs smokers, the mean difference in gingival index between '0' to 90th day was statistically significant for SRP and SRP + CHL and statistically not significant for CHL.

D) RELATIVE ATTACHMENT LEVEL:

In non-smokers, the mean gain in relative attachment level from '0' to 90th day was 24.7% and 18.5% for SRP and SRP + CHL respectively. These findings were similar to that of **Soskolne et al** [16] who studied the changes in probing depth following 2 years of periodontal maintenance therapy including adjunctive controlled release of biodegradable chlorhexidine chip. There was 20.4%, mean gain in relative attachment level from baseline to 90th day for CHL, which was statistically highly significant. In smokers, the mean gain in relative attachment level from '0' to 90th day was 23.7%, 21% and 20.4% for SRP, SRP + CHL and CHL respectively which was highly significant. On comparison of relative attachment level in non-smokers Vs smokers, the mean difference in relative attachment level between '0' to 90th day for SRP, SRP + CHL and CHL was statistically not significant.

PREVALENCE OF VARIOUS MICROORGANISMS AT DIFFERENT INTERVALS OF STUDY PERIOD IN SMOKERS AND NON-SMOKERS:

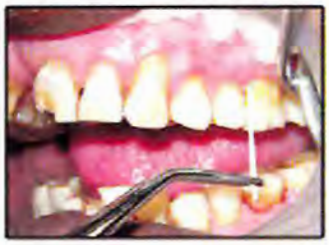
1) Fusobacterium nucleatum: On comparison of non-smokers to smokers, Fusobacterium nucleatum showed 94% reduction in non-smokers and 100% reduction in smokers, which was statistically not significant. The above findings for the three bacteria are similar to that of **Daneshmand et. al.** [17]

2) Porphyromonas gingivalis: On comparison of non-smokers to smokers, Porphyromonas gingivalis showed 81.2% reduction in nonsmokers and 100% reduction in smokers, which was statistically not significant.

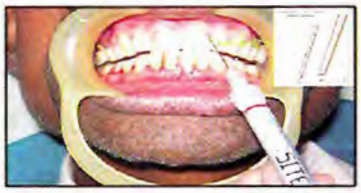
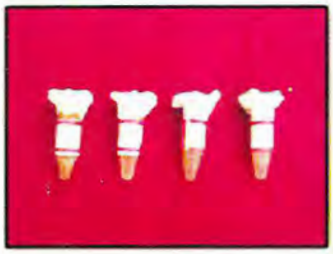
3) Tannerella forsynthesis : On comparison of non-smokers to smokers, Tannerella forsynthesis showed 100% reduction in both groups which was statistically not significant.

CONCLUSION

On comparison of smokers and non-smokers, in SRP group, non-smokers showed a higher reduction in BI and GI and smokers showed a higher reduction in PI. There was no significant gain in RAL of both smokers and non-smokers. In SRP + CHL group, non-smokers showed a higher reduction in relation to BI and GI and smokers showed a higher reduction to relation to PI. There was no significant gain in RAL of both smokers and non-smokers. In CHL group, both smokers and non-smokers showed a non-significant reduction in BI, GI and RAL but smokers showed a significant reduction in PI as compared to non-smokers.

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