

EVALUATION OF ROLE OF XANTHAN BASED CHLORHEXIDINE GEL (CHLOSITE) FOR ENHANCED THERAPEUTIC EFFICIENCY IN CHRONIC PERIODONTITIS-A PILOT STUDY

■ Dr. Nitin Tomar

INTRODUCTION

Periodontitis is a complex disease that involves the loss of attachment around teeth resulting from action of microorganisms and the response of the host to these organisms. In early periodontitis with pockets of less than or equal to 5 mm in depth, only scaling and root planning (SRP) is usually effective in reducing bacterial count and pocket probing depth. The pockets of more than 5 mm do not respond favorably to SRP. For such cases surgery is the accepted treatment modality. However, in borderline cases, where localized pockets are present in the range of 4-6mm, local administration of chemotherapeutic agents can effectively eliminate the bacteria harbored at the bottom of deeper pockets.

Advantages of Local drug delivery (LDD) over systemic therapy include achieving higher concentration at target site without inducing drug resistance and toxicity.² Local delivery of antimicrobial agents into periodontal pockets has been extensively in use since 1970's and many systems have been designed to maintain high level of antimicrobial agent in crevicular fluid with minimal systemic uptake.³

Xanthan based chlorhexidine gel (CHLOSITE, GHIMAS, ITALY) (Fig 1) containing 0.5% chlorhexidine digluconate and 1.0% chlorhexidine dihydrochloride incorporated in a saccharidic polymer, xanthan is a recent newly developed local drug delivery system. Xanthan is a natural, biocom-



Fig 1. Chlorhexidine Gel (Chlosite) in a syringe



Fig 2. Paper points in place to dry the periodontal pocket



Fig 3 Insertion of Chlorhexidine Gel



Fig 4. Coe Pak Application

patible saccharidic polymer used in medicine for mucoadhesion and in controlled delivery of ophthalmic drugs, theophylline, and oral drugs, indomethacin and diclofenac sodium.

AIM

- To propose a therapy for enhanced efficiency of scaling and root planing in chronic periodontitis by controlled local delivery of xanthan based chlorhexidine.

OBJECTIVES

- To evaluate efficacy of scaling and root planing alone without xanthan based chlorhexidine gel incorporation.
- To evaluate efficacy of xanthan based chlorhexidine gel adjunctive to scaling and root planing in treating chronic periodontitis.

MATERIALS AND METHODS

A randomized, controlled, split mouth, single centre study was conducted in the Department of Periodontics, Subharti Dental College, Meerut.

Inclusion criteria:

- Chronic periodontitis diagnosed patients
- Age: 30-65 years.
- Patients with at least 3 non-adjacent interproximal 5-8mm deep pockets.

Exclusion criteria:

- History of antimicrobial mouth rinse use since last 2 months.
- Candidates for periodontal surgery.
- Medically compromised patients.
- Past/current smokers.

Sample size included 5 patients (20 sites, 2 groups with 10 sites in each

group) of chronic periodontitis:

GROUP TREATMENT

A: Control Scaling and root planing
B: Test Scaling and root planing +
Immediate insertion of chlorhexidine gel

Clinical evaluation screening visit included periodontal examination of all eligible patients with the UNC-15 (University of North Carolina) probe. Mesial and distal measurements were made with relation to each tooth. Cold cure acrylic resin occlusal stents for periodontal probe positioning were fabricated on a cast model by alginate impressions. The stent was stable, easy to position and remove by therapist. It covered occlusal surfaces of teeth being treated and extended on the occlusal surfaces of at least one tooth in the mesial and distal directions, and covered the coronal third of the involved teeth. Grooves were placed so that measurements made on recall appointments could be made in the same orientations as those prior to treatment. It was stored on a dental cast to minimize distortion.

CLINICAL PARAMETERS:

Baseline oral examination visit comprised of following clinical parameters associated with targeted teeth:

- Gingival index (Loe & Sillness 1963).
- Probing depth and clinical attachment level measured by UNC-15 probe.

GEL APPLICATION:

Scaling, root planing, pocket irrigation with normal saline and drying with paper points were carried out (**Fig 2**). CHLOSITE was applied directly from the commercially supplied syringe into the pocket using a special needle with a blunt tip and lateral opening facilitating gel application without traumatizing/ damaging periodontal tissue (**Fig 3**). The gel was injected first into the deepest part of the pocket and then while continuing to extrude the

material, the needle was slowly withdrawn till it reached the superior portion of the pocket. This was followed by placement of periodontal pack (**Fig 4**). Patient was advised oral hygiene instructions. Oral and periodontal examination was carried out again at 3 months recall visit and measurements recorded.

RESULTS

Baseline visit mean plaque score was 1.54, which decreased to 0.72 after 3 months in Group A whereas it was 1.69 at baseline visit and 0.49 after 3 months in Group B. Baseline visit mean pocket depth was 5.54 in Group A and 5.52 at 3 months. In Group B mean pocket depth was 6.46 and 4.63 at baseline visit and 3 months respectively.

Mean clinical attachment level was 6.65 in Group A at baseline visit and was 5.982 after 3 months whereas for Group B it was 6.59 at baseline visit and 4.68 after 3 months.

Thus results show that better clinical results are obtained in group B as compared to group A.

DISCUSSION

The concept of controlled release local delivery of therapeutic agents was first introduced by Dr Max Goodson⁴ to deliver hollow fibers of cellulose acetate filled with tetracycline in periodontal pockets. Since then, several other products, all biodegradable, have been developed and tested for their efficacy. These include metronidazole gel (Elyzol), Minocycline ointment (Periocline). Minocycline microspheres (Arestin), Doxycycline polymer (Atridox), Chlorhexidine gel (Corsodyl gel, Hexigel), chlorhexidine varnish (Chlorzoin and Cervitec) and chlorhexidine chip (Periochip).

Recently, a new 1.5% chlorhexidine gel named chlosite, a xanthan based gel was introduced in Italy in 2003. This gel is a combination of 0.5% chlorhexidine digluconate and 1% chlorhexidine dihydrochloride.

The small molecule of chlorhexidine digluconate releases first, maintaining adequate concentration of chlorhexidine for 6 to 9 days with a total release of equal to 85% of total amount of chlorhexidine. Chlosite has an additional advantage of prolonged adhesion to mucus membrane because of xanthan gum which can stick inside the pocket as long as 153.5 mins and cannot be easily washed out by GCF or saliva.⁵

The results of the present study were in accordance with the study of Chandra C6 who reported that combination of scaling and root planing with chlosite resulted in added benefits as compared to Chlosite alone or SRP alone. Similar results were obtained by Eid et al⁷ who stated that both treatment modalities led to a highly statistically significant reduction in microbiological counts as well as clinical parameters applied. No clinical relevant side effects were observed.

Paolantonio et al⁸ also studied clinical, microbiologic, and biochemical effects of a xanthan-based chlorhexidine gel in the treatment of periodontitis and reported that ChloSite treated sites showed significantly greater improvement for primary endpoints (at 6 months, a mean reduction in pocket depth of 0.83mm and mean improvement in clinical attachment level of 0.9mm)

CONCLUSION

The results from the present study suggest that the application of xanthan based chlorhexidine gel following scaling and root planing may be a useful adjunct for the treatment of chronic periodontitis.

The present study being a pilot one suggests that long term studies with a larger sample size is required along with statistical analysis, to provide further evidence in favour of the positive effects of xanthan based chlorhexidine gel for efficient clinical therapeutic approach of chronic periodontitis.