

Original Article

Evaluation of the efficacy of 0.12% chlorhexidine and water as Oral Irrigants in Chronic Periodontitis

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ABSTRACT:

Background: Different irrigating solutions may serve to provide bacteria free environment. The present study was conducted to compare efficacy of different irrigating solution in root canal treatment. **Materials & Methods:** The present comprised of 40 mandibular molars with chronic periodontitis. All teeth were divided into 2 groups of 20 each. In group I teeth were irrigated with 0.12% chlorhexidine and in group II teeth were irrigated with water. In both groups, plaque score and gingival scores were recorded at day 1, 7 and 21. **Results:** In group I teeth were irrigated with 0.12% chlorhexidine and in group II teeth were irrigated with water. Plaque score at day 1 was 1.34, at 7 days was 1.12 and at 21 days was 1.02 in group I. It was 2.98 at day 1, 2.02 at day 7 and 1.56 at day 21. The difference was significant ($P < 0.05$). Gingival score at day 1 was 1.12, at 7 days was 1.04 and at 21 days was 0.82 in group I. It was 2.26 at day 1, 1.98 at day 7 and 1.16 at day 21. The difference was significant ($P < 0.05$). **Conclusion:** Authors suggested that the efficacy of any irrigating solution can be judged by its ability to relieve symptoms. 0.12% chlorhexidine found to be better in root canal therapy.

Key words: Chlorhexidine, irrigating solution, molars

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INTRODUCTION

Bacteria have long been recognized as the primary etiologic factors in the development of pulp and periapical lesions. Remove all the material inside the canal is a necessity for success of the root canal procedures. However, limitations of debridement by hand and mechanical way have been reported in recent studies. The internal anatomy of the canals and lack of practice of the clinician predispose to transport the main canal, perforations and apical blockage.¹ Successful root canal therapy depends on thorough chemo-mechanical debridement of pulpal tissue, dentin debris, and

infective microorganisms. Irrigants can augment mechanical debridement by flushing out debris, dissolving tissue, and disinfecting the root canal system.¹ Chemical debridement is especially needed for teeth with complex internal anatomy such as fins or other irregularities that might be missed by instrumentation.² Ideal requirements of root canal irrigants are that it should have broad antimicrobial spectrum, high efficacy against anaerobic and facultative microorganisms organized in biofilms, ability to dissolve necrotic pulp tissue remnants, ability to inactivate endotoxins and ability to prevent the formation of a smear

layer during instrumentation or to dissolve the latter once it has formed.³

Different irrigating solutions may serve to provide bacteria free environment such as ethylenediamine tetraacetic acid (EDTA), 5.25% sodium hypochlorite (NaOCl), Biopure MTAd, water and 0.12% chlorhexidine etc.⁴ The present study was conducted to compare efficacy of different irrigating solution in root canal treatment.

MATERIALS & METHODS

The present study comprised of 40 mandibular molars with chronic periodontitis. The study protocol was approved from institutional ethical committee.

All teeth were divided into 2 groups of 20 each. In group I teeth were irrigated with 0.12% chlorhexidine and in group II teeth were irrigated with water. In both groups, plaque score and gingival scores were recorded at day 1, 7 and 21. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I Distribution of teeth

Group	Group I	Group II
Solution	0.12% chlorhexidine	Water
Number	20	20

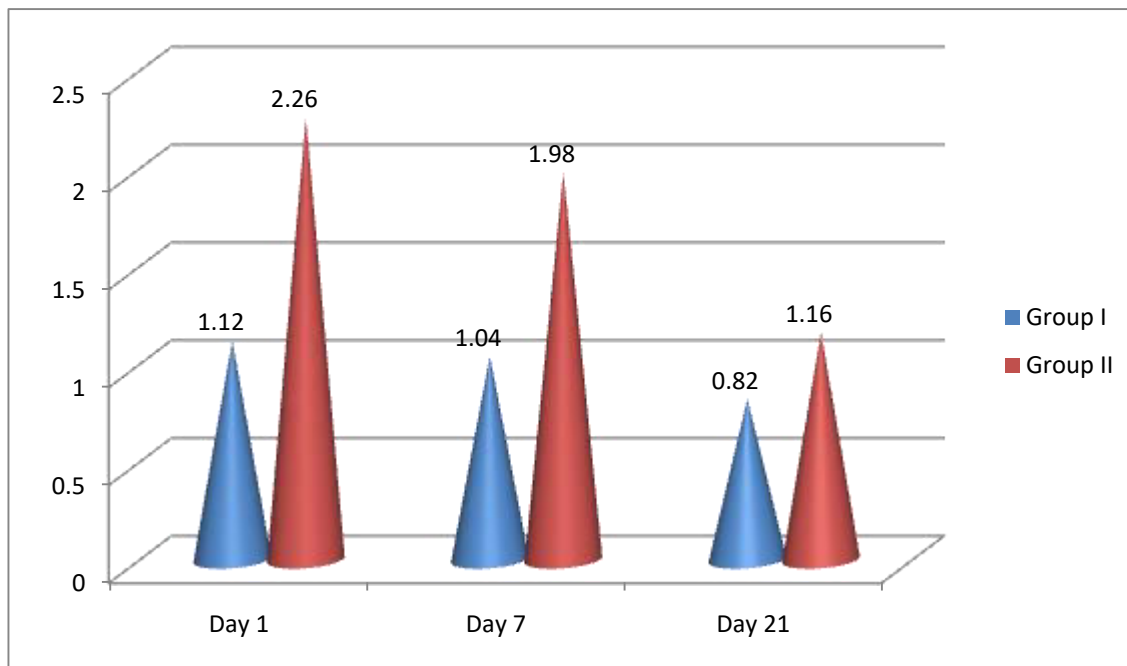
Table I shows that in group I teeth were irrigated with 0.12% chlorhexidine and in group II teeth were irrigated with water.

Table II Plaque score in both groups

Days	Group I	Group II	P value
Day 1	1.34	2.98	0.01
Day 7	1.12	2.02	0.05
Day 21	1.02	1.56	0.02

Table II shows that plaque score at day 1 was 1.34, at 7 days was 1.12 and at 21 days was 1.02 in group I. It was 2.98 at day 1, 2.02 at day 7 and 1.56 at day 21. The difference was significant (P< 0.05).

Graph I Gingival score in both groups



Graph I shows that gingival score at day 1 was 1.12, at 7 days was 1.04 and at 21 days was 0.82 in group I. It was 2.26 at day 1, 1.98 at day 7 and 1.16 at day 21. The difference was significant (P< 0.05).

DISCUSSION

Different irrigating solutions have been used in endodontics. They have different chemical and physical properties. Chlorhexidine is a cationic molecule, which can be used during treatment. It has a wide range of antimicrobial activity.⁵ Its cationic structure provides a unique property named substantivity. CHX has antibacterial and antifungal activity, its effect on biofilm, its substantivity its tissue solvent ability, its interaction with calcium hydroxide and sodium hypochlorite, its anti-collagenolytic activity, its effect on coronal and apical leakage of bacteria, its toxicity and allergenicity and the modulating effect of dentine and root canal components on its antimicrobial activity.⁶ The present study was conducted to compare efficacy of different irrigating solution in root canal treatment.

In present study there were 40 teeth. We observed that there was significant difference in occurrence of smear layer at different level of tooth surface in group I and group II. Takeda et al⁷ in their study 50 mandibular premolars were decoronated and split longitudinally. Each root half was divided into five groups (n = 10): Group I - 3 ml of physiological saline, Group II - 3 ml of 2.5% sodium hypochlorite (NaOCl), Group III - 1 ml of 10% citric acid, Group IV - 2% chlorhexidine (CHX) gluconate (Vishal Dentocare, India), Group V - Largal Ultra (ethylenediaminetetraacetic acid [EDTA] 15% + cetrimide 0.75%), Septodont), and Group VI - Smear Clear (Sybron Endo, Orange, CA, USA) (17% EDTA, cetrimide, and a special surfactant). Irrigation regimens were performed for 1 min. The presence or absence of smear layer at the coronal, middle, and apical portion of each canal were examined under an SEM. A significant difference in smear layer removal between smear clear and Largal Ultra at the apical and middle third of the canal was observed.

Chlorhexidine is a synthetic cationic bis-guanide that consists of two symmetric 4-chlorophenyl rings and two biguanide groups, connected by a central hexamethylene chain. CHX is a positively charged hydrophobic and lipophilic molecule that interacts with phospholipids and lipopolysaccharides on the cell membrane of bacteria and then enters the cell through some type of active or passive transport mechanism.⁸

Khanna A et al⁹ in their study a total of 40 patients were randomly and equally divided into 2 test groups. Test group 1 consisted of patients irrigated with 0.12% Chlorhexidine digluconate. Test group 2 consisted of Patients irrigated with distilled water (control). In office, the patients were treated with irrigation using oral irrigator device (Water Pik) in all areas with pocket formation >3mm respectively in both test groups i.e. test group 1 with 0.12% chlorhexidine digluconate and test group 2 with distilled water on day 0 (baseline), 7, 21 and 42. At home, patients were instructed to rinse i.e. test group 1 with 0.12% chlorhexidine digluconate and test group 2 with distilled

water twice a day, atleast half an hour after toothbrushing for 21 days. Loe and Silness gingival index to assess gingival scores. Mean plaque score in the 20 patients at day 0, 7 and 21 was 1.3, 1.1 and 1.0 respectively. Significant results were obtained while comparing the mean plaque score, gingival score, calculus score and pocket depth in between various time intervals.

CONCLUSION

Authors suggested that the efficacy of any irrigating solution can be judged by its ability to relieve symptoms. 0.12% chlorhexidine found to be better in root canal therapy.

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