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ORIGINAL ARTICLE

Comparison of Calcium Hydroxide and Triple Antibiotic Paste as Intracanal Medicament in Emergency Pain Reduction: *In vivo* Study

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ABSTRACT

Aim: The aim of this study is to evaluate the effectiveness of calcium hydroxide (CH) and triple antibiotic paste (TAP) as an intracanal medicaments in pain reduction.

Materials and methods: Thirty patients reporting to the Department of Conservative Dentistry and Endodontics, with chief complaint of emergency pain and planned for conventional root canal treatment will be randomly selected and were further divided into two test groups. Group I – receiving CH as intracanal medicament, and group II – receiving TAP as intracanal medicament. Preoperative pain will be recorded by the patient using visual analog pain scale. Interappointment pain will also be recorded in the same manner. Inclusion was limited to patients coming for emergency pain.

Results: The overall incidence of mean range of pain found in CH group (mean range of pain after 1 hour: 20.33 mean value) is significantly higher than TAP (10.67 mean value after 1 hour) with Mann–Whitney U test. This signifies that patients undergoing endodontic therapy with TAP carry high significant (twice) results in pain reduction with each visits.

Conclusion: Calcium hydroxide and TAP are effective in managing interappointment pain. Triple antibiotic paste is more effective than CH in preventing the occurrence of pain.

Keywords: Calcium hydroxide, Emergency pain, Intracanal medicament, Triple antibiotic paste.

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INTRODUCTION

Pain of endodontic origin has been a common concern for both the clinicians and the patients for many years. Endodontic posttreatment pain remains to be a significant problem facing the dental profession. Antibacterial intracanal dressing has been advocated to eliminate remaining bacteria after chemomechanical preparation.[1] Various intracanal medicaments are advocated to eliminate bacteria and prevent multiplication of bacteria between the appointments. Calcium hydroxide (CH) has been the most commonly used medicament, and its dressing is shown to provide more bacteria-free canals than those devoid of any dressing.[2,3] Local application of antibiotics in the root canal has been suggested to overcome the potential risks of adverse systemic effects of antibiotics and as an effective mode for drug delivery in teeth lacking blood supply due to necrotic pulps or pulp-less status because root canal infections are polymicrobial consisting of both aerobic and anaerobic bacterial species. Single antibiotic may not be effective in canal disinfection. Therefore, combination antibiotics mainly consisting of ciprofloxacin, metronidazole, and minocycline, referred as triple antibiotic paste (TAP) has been suggested for root canal disinfection.[4] Various studies have shown that minocycline causes potential tooth discoloration.[5] Recent studies have shown that clindamycin or cefaclor can be other substitute for TAP.

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MATERIALS AND METHODS

Thirty patients reported to the Department of Conservative Dentistry and Endodontics with chief complains of emergency pain. The selected patients were randomly grouped into two groups. Group I – 15 patients were receiving CH as intracanal medicament, and group II – 15 patients were receiving TAP as intracanal medicament. Patients presenting to the department with emergency pain with acute and chronic apical periodontitis and acute and chronic irreversible pulpitis, necrotic tooth were included in the study, and cases of acute apical abscess and retreatment cases were not included in the study. Preoperative pain as well as interappointment will be recorded by the patient using visual analog pain scale, with score ranging from 1 to 4.

Visual Analog Pain Scale Rating

- 0–25: No pain to mild pain, requiring no analgesic medication (score 1)

- 25–50: Moderate pain requiring analgesic for relief (score 2)
- 50–75: Severe pain, pain not relieved by above medicaments (score 3)
- 75–100: Extreme pain, pain not relieved by any measure taken (score 4).

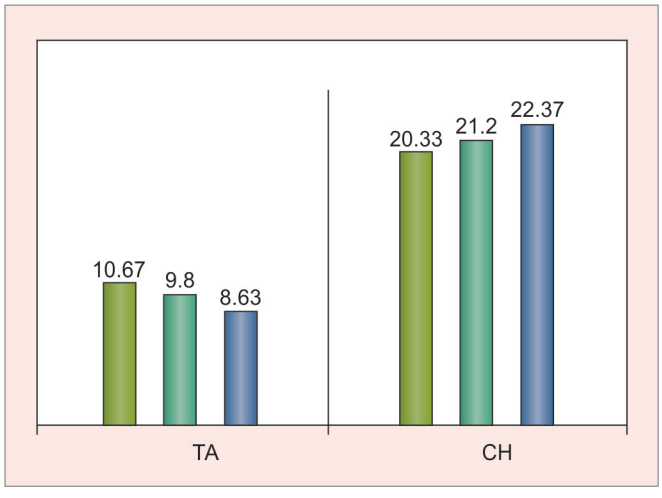
No antibiotic was prescribed and the patients who had been taking antibiotics were recorded. Patients were then requested to stop antibiotics. They were also requested to stop taking analgesics. With the provision that if pain were to persists or recur, analgesics could again be taken. Root canal treatment was initiated under local anesthesia and rubber dam isolation. Working length was established 1 mm from the radiographic apex. The coronal one-third of the canal was enlarged using Gates Glidden (Mani, Inc., Tochigi, Japan). The apical portion of the canal was enlarged using K-files (Dentsply Maillefer, Ballaigues Switzerland) to size 3 to 4 files larger than the initial apical file, and rest of the canal was prepared using step-back technique. The canals were irrigated copiously with 2.5% sodium hypochlorite (Novo Dental Products Pvt. Ltd, Mumbai, India), 17% ethylenediaminetetraacetic acid (BN Laboratories, Mangaluru, India), normal saline, and 0.2% chlorhexidine (Vishal Dent Care Pvt. Ltd, Ahmedabad, India). The final irrigation was done with normal saline. Following instrumentation and irrigation, canals were dried and treated in the following manner.

Group I: CH was placed as an intracanal medicament. A total of 100 mg of CH powder (Dento Kem, Faridabad, India) was dispensed and mixed with one drop of propylene glycol on a clean and dry glass slab to prepare a thick paste-like consistency. This paste was carried into the canal and gently compacted using a lentulo spirals, and access opening was restored temporarily with zinc oxide eugenol cement.

Group II: TAP was used as an intracanal medicament. It was prepared by removing the coating and crushing of antibiotic ciprofloxacin (Ciplox 500 mg, Cipla, India), metronidazole (Metrogyl 400 mg, JB Chemicals and Pharmaceuticals Ltd, India), and clindamycin tablets separately using a mortar and pestle. The crushed powder was passed through a fine sieve to remove heavy filler particles and obtain a fine powder. The ciprofloxacin, metronidazole, and clindamycin powders thus obtained were weighed separately and mixed in a 1:3 proportions respectively, to obtain triple antibiotic (TA) mixture. A total of 100 mg of this TA mixture was dispensed and mixed with one drop of propylene glycol to get a thick paste-like consistency. This paste was placed gently compacted into the canal using a finger plugger, and access opening was restored with zinc oxide eugenol cement.

RESULTS

Among the 30 patients evaluated, both groups are highly significant. The overall highest incidence of mean range of pain found in CH group (mean value of pain after 1 hour: 20.33) is significantly higher than TAP (10.67 after 1 hour) with Mann–Whitney U test (Graph 1). Similarly after second visit, TAP (mean value of pain 9.80) compared with CH (21.20) carries twice significant in pain reduction. Similarly after third visit which was evaluated after 1 week, both groups, CH group and TAP, produce highly significant pain reduction (Tables 1 and 2). Triple antibiotic paste more significant in pain reduction than CH group (before treatment p-value –0.448 non significant) while after first visit p-value –0.002 highly significant) after second and third visit p-value –0.000 highly significant.



Graph 1: Comparison of pain reduction in both the groups with Mann–Whitney U test

Table 1: Mann–Whitney U test showing mean range of pain occurrences in TAP and CH after each visit

Ranks	*Groups*	*n*	*Mean rank*	*Sum of ranks*
	1.00	15	16.70	250.50
Before_VAS	2.00	15	14.30	214.50
	Total	30		
	1.00	15	10.67	160.00
one_hour_VAS (A1)	2.00	15	20.33	305.00
	Total	30		
	1.00	15	9.80	147.00
A2_VAS	2.00	15	21.20	318.00
	Total	30		
	1.00	15	8.63	129.50
A3_VAS	2.00	15	22.37	335.50
	Total	30		Group I–TAP Group II–CH

VAS: Visual analog scale; A1 – after 1 hour; A2 – after 48 hours; A3 – after 7 days

Table 2: Test statistics

Test statistics[a]	*Before_VAS*	*one_hr_VAS*	*A2_VAS*	*A3_VAS*
Mann–Whitney U	94.500	40.000	27.000	9.500
Wilcoxon W	214.500	160.000	147.000	129.500
Z	–0.758	–3.044	–3.569	–4.322
Asymp. Sig. (2-tailed)	0.448	0.002	0.000	0.000
Exact Sig. [2*(l-tailed Sig.)]	461[b]	0.002[b]	0.000[b]	0.000[b]

[a]Grouping Variable: Group; [b]Not corrected for ties

DISCUSSION

Pain is inherently subjective and its measurements primarily rely on the verbal report of the patients. Several scales and methods have been used for the assessment of pain after endodontic therapy. Among them, Visual analog scale is considered to be a valid and reliable scale for the measurement of pain. Therefore, VAS[1] is used in this study to evaluate the interappointment pain. The scores of VAS were categorized into two groups (score, ranging from 1 to 4) based on the need and quantity of analgesic intake for any pain relief. This was done to make the patient understand the pain scale better quantitatively and accurately. The recommended retention period for the intracanal medicament is 7 days; however, recontamination of the canal may take place if the medicament is retained for 2 weeks. Considering a minimum 1 week retention period, medicaments will be placed during access opening and will be changed after 2 days in the study. Combination of these three antibiotics overcomes bacterial resistance and achieves higher antimicrobial action. Previous studies have shown favorable results when antibiotic mixture of ciprofloxacin, metronidazole, and minocycline has been used as topical root canal agents. In the present study, highest incidence of mean range of pain found in CH group is significantly higher than TAP. This signifies that patients undergoing endodontic therapy with TAP carry high significant results in pain reduction with each visits.

CONCLUSION

Application of antibiotics locally within root canal space is more effective than systemic mode of administration in endodontic procedures.

Calcium hydroxide and TAP are effective for managing interappointment pain. Triple antibiotic paste is more effective than CH in preventing the occurrence of pain.

REFERENCES

1. Ehrmann EH, Messer HH, Adams GG. The relationship of intracanal medicaments to postoperative pain in endodontics. Int Endod J 2003 Dec;36(12):868-875.
2. Mohammadi Z, Dummer PM. Properties and applications of calcium hydroxide in endodontics and dental traumatology. Int Endod J 2011 Aug;44(8):697-730.
3. Anjaneyulu K, Nivedhitha MS. Influence of calcium hydroxide on the post-treatment pain in Endodontics: a systematic review. J Conserv Dent 2014 May;17(3):200-207.
4. Pai S, Vivekananda Pai AR, Thomas MS, Bhat V. Effect of calcium hydroxide and triple antibiotic paste as intracanal medicaments on the incidence of inter-appointment flare-up in diabetic patients: an *in vivo* study. J Conserv Dent 2014 May;17(3):208-211.
5. Mandwe Ashish P, Patil Pravin G, Shetty Heeresh K, Shetty Vathsalya K, Pimpale Sandeep K. Role of triple antibiotic paste in revascularization and endodontics – a review. Int J Contemp Med Res 2015;2(2):186-190.