Original Article

Comparison of Mean Postoperative Pain Score in Patients Treated with Or Without Mixture Of 2% Chlorhexidiene Plus Calcium Hydroxide after Endodontic Treatment

Muhammad Shairaz Sadiq[1], Sadia Javed[2], Fareed Ahmad[1], Sana Akram[3], Farhan Riaz[3] and Ehsan Rathore[3]

ABSTRACT

Objective: To compare mean post-operative pain score in patients treated with or without mixture of 2% chlorhexidiene plus calcium hydroxide after endodontic treatment.

Study Design: Descriptive cross sectional study

Place and Duration of Study: This study was conducted at the Department of Operative Dentistry Faryal Dental College, Sheikhupura from November 2020 to April 2021.

Materials and Methods: Total 60 patients of both genders referred for endodontic treatment were enrolled in this study. Patients were split in 2 equal groups, group A and group B. By using 1.8 ml of 2% lignocaine containing 1:100,000 epinephrine, tooth was anesthetized and isolated using rubber dam.

Results: The mean postoperative pain score was Chlorhexidine + calcium hydroxide group and in without Chlorhexidine + calcium hydroxide group was (1.57±1.07 vs. 7.17±1.17; $p<0.05$), the statistical significance difference between two groups was observed.

Conclusion: Postoperative endodontic pain using mixture of 2% chlorhexidine and calcium hydroxide is significantly reduced ($p<0.001$). The decrease in microbial causes leading to post treatment pain, inflammation and discomfort for patients and the dentist, can be reduced by use of intra canal medicament.

Key Words: Chlorhexidiene, calcium hydroxide, endodontic treatment, postoperative pain

Citation of article: Sadiq MS, Javed S, Ahmad F, Akram S, Riaz F, Rathore E. Comparison of Mean Postoperative Pain Score in Patients Treated with Or Without Mixture Of 2% Chlorhexidiene Plus Calcium Hydroxide after Endodontic Treatment. Med Forum 2022;33(4):28-31.

INTRODUCTION

To reduce or eliminate microorganisms from the root canal space is the goal of endodontic treatment, preventing reinfection and by sealing the root canal system, promotes the healing of the periapical tissue.[1,2] The most common reason to be considered for which a patient visits a dentist is pain.[3]

[1.] Department of Oral Medicine, Institute of Dentistry CMH, Lahore Medical College, Lahore.
[2.] Department of Operative Dentistry, Shahida Islam Dental College, Lodhran.
[3.] Department of Oral Medicine, Faryal Dental College, Sheikhupura.

Correspondence: Dr. Sana Akram, Assistant Professor, Department of Operative Dentistry, Faryal Dental College, Sheikhupura.
Contact No: 03224603481
Email: dr.sana.ahtesham@gmail.com

Received: October, 2021
Accepted: January, 2022
Printed: April, 2022

Though, for their refusal to undergo treatment, it is one of the collective factor. Because of operator technique, form of irrigation and type of endodontic system used, post-endodontic pain could be a complication.[4] Instrumentation, irrigation and application of intracanal medicaments is a problematic job in the eradication of microorganism. Consequently, for eradication of infected tissues and microorganisms application of chemical irrigators and intra canal medicaments seem crucial in addition to mechanical debridement.[5]

Alkaline pH value of calcium hydroxide is round about 12.5. Liberation of hydroxyl ion from calcium hydroxide in an aqueous environment renders it antimicrobial property. Most of the microorganisms that are source of root canal infection are unable to sustain alkaline environment.[6] Chlorhexidine gluconate is both bacteriostatic and bactericidal in low and high concentrations respectively.[7] Ability of chlorhexidine to bond with dentinal hydroxyapatite gives it a unique characteristic of substantivity.[8]

Singh et al conducted a research,6 there was a notable difference($p<0.001$) in pain reduction amongst the four experimental groups, that were labelled chlorhexidine

and calcium hydroxide, chlorhexidine, calcium hydroxide and control group (placebo). Pain reduction in groups, in which either a mixture of chlorhexidine with calcium hydroxide or chlorhexidine was used individually was remarkably higher ($p<0.05$) than in groups in which calcium hydroxide and placebo was administered.[9]

To the best of our knowledge there is no local study available on this topic in our setup. Therefore, the goal of this research is comparison of mean post-operative pain score in patients treated with or without mixture of 2% chlorhexidiene plus calcium hydroxide after endodontic treatment.

MATERIALS AND METHODS

After taking permission from Institutional Review Board of the hospital this randomized controlled trial was conducted at Department of Operative Dentistry Faryal Dental College, Sheikhupura from 1st November 2020 to 30th April 2021. A total of 60 patients of both genders referred for endodontic treatment were enrolled in this study. Informed written consent was obtained from the patients.

Patients who complained of spontaneous moderate to severe pain matched the study's inclusion criteria. Sixty male and female patients with age limit of 20-60 years and. Any type of permanent tooth with diagnosis of symptomatic irreversible pulpitis with normal periapex, were incorporated in the study. The teeth that had previously been retreated were included in the exclusion criteria. Also the patients with necrotic pulps, apical periodontitis and acute abscess were excluded from the study.

Patients were split in 2 equal groups, group A and group B. By using 1.8 ml of 2% lignocaine containing 1:100,000 epinephrine, tooth was anesthetized and isolated using rubber dam. Access cavity was made. Pulpectomy was done following which endodontic work length was taken with an apex locator and rechecked by a periapical radiograph. Step back technique was used. Irrigation was carried out using sodium hypochlorite. After drying canals, Inter appointment medicament was then packed in the canals in both groups. Mixture of 2% Chlorhexidine and calcium hydroxide was put down in canals of patients included in group A while No drug was placed in canals of patients in group B. Cavit (3M ESPE, St Paul, MN, USA) was set as a temporary restoration of endodontic access cavity and a questionnaire containing the VAS was provided to each individual for them to note the magnitude of pain felt after 24 hours. Root canal treatment was accomplished in the next appointment.

Data analysis was done using SPSS-20. Mean pain score in two groups were compared by applying independent samples t-test.

RESULTS

Thirty three (55%) were male and 27 (45%) were females, in group A 43.3% patients have age 20-40 years and 56.66% patients have age of 41-60 years, while in group B 36.66% patients have age of 20-40 years and 63.33% patients belonged to 61 to 60 years (Table 1). The mean postoperative pain score was Chlorhexidine + calcium hydroxide group and in without Chlorhexidine + calcium hydroxide group was (1.57±1.07 vs. 7.17±1.17; $p<0.05$), the statistical significance difference between two groups was observed (Tables 2-3).

Table No.1: Demographics of the included patients

Variable	Group A	Group B
Gender		
Male	18 (60.0%)	15 (50.0%)
Female	12 (40.0%)	15 (50.0%)
Age		
20-40	13 (43.3%)	11(36.66%)
41-60	17 (56.66%)	19 (63.33%)
Mean±SD	27.45±7.52	26.77±7.32

Table No.2: Comparison of postoperative endodontic pain score

Variable	Group A	Group B	P value
VAS Score	1.57±1.07	7.17±1.17	P< 0.001

Table No.3: Data stratification with age of the patients

Age	Group	Mean±SD	P value
20-40	A	1.23±1.16	P<0.001
	B	7.29±1.49	
41-60	A	1.82±0.95	P<0.001
	B	7.06±0.85	

DISCUSSION

The current research is carried out to compare of mean postoperative pain score in patients treated with or without mixture of 2% chlorhexidiene plus calcium hydroxide after endodontic treatment. After irreversible pulpitis, the root canals port bacteria as well as tissue debris is the cause of contamination and infection to apical periodontium.[10]

Findings of the current study demonstrated that administration of chlorhexidine in combination with calcium hydroxide resulted in statistically significant reduction in pain score. Chlorhexidine has swift and constant action to control postoperative pain. Its remarkable result was evident within 4 hours of being placed. This remarkable effect confirms the results of previous studies[11,12] according to that chlorhexidine demonstrated its high diffusibility and provided 100% hampering of microorganisms.

According to a study by Al-Negrish and Hababheh[13], there was a 24.1% incidence after two days and a 5.3% incidence at seven days after surgery. Despite the fact

that the intracanal medicament employed was a proprietary calcium hydroxide paste, the authors' results at 7-day post-operative assessment are identical to this study. Using Visual Analogue Scale, Ghoddusi et al[14] found a 15% incidence of post-operative pain at 6-hourly intervals for up to 72 hours. For this research, this varies from the figures probably due to differences in the timing of post-operative assessment and calcium hydroxide (aqua) mixing. Udoye and Aguwa[15] used comparable pain rating criteria to this study and found a 10% incidence of post-operative pain. This number is also significantly greater than the regular saline therapy group's incidence rate however; in findings of our study it is similar to that of treatment group of chlorhexidine. However, the study did not specify the time period during which post-operative pain was measured, nor the vehicle utilized to mix calcium hydroxide.

However, according to Gomes et al[16] 2% chlorhexidine was not successful in washing out microorganisms. Also, the present study does not agree with the outcomes of research carried out by Gama et al.[17] who found 0.2 percent calcium hydroxide or chlorhexidine gluconate in mixture with CPMC (camphorated paramonochlorophenol paste) intracanal dressing to be equally fruitful in bringing down the discomfort after root canal therapy.

It can be concluded that, the mixture of calcium hydroxide and chlorhexidine is most useful in decreasing the postoperative pain when com- pared with placebo (1.57±1.07 vs 7.17±1.17) with P<0.001. Study initiated by Yoldas et al[18] announced marvelous efficacy of mixture of calcium hydroxide and chlorhexidine to lessen post endodontic pain in endodontic retreatment cases. Contact angle of calcium hydroxide is reduced by the addition of chlorhexidine which has an increased wetting effect in the root canal. As long as study by Delgado et al[19] is considered, no difference is found in antimicrobial action of chlorhexidine either used individually or in combination with calcium hydroxide.

CONCLUSION

In conclusion, postoperative endodontic pain using mixture of 2% chlorhexidine and calcium hydroxide is significantly reduced (p<0.001). The decrease in microbial causes leading to post treatment pain, inflammation and discomfort for patients and the dentist, can be reduced by use of intra canal medicament.

Author's Contribution:

Concept & Design of Study:	Muhammad Shairaz Sadiq
Drafting:	Sadia Javed, Fareed Ahmad
Data Analysis:	Sana Akram, Farhan Riaz, Ehsan Rathore
Revisiting Critically:	Muhammad Shairaz Sadiq, Sadia Javed
Final Approval of version:	Muhammad Shairaz Sadiq

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Misgar OM, Farooq R, Purra AR, Ahanger FA, Zargar W. Clinical and radiographic study of the causes of primary endodontic treatment failure 2018;4(1):21-24.
2. Jahanzeb K, Shah SI, Qureshi A, Pasha F. Reasons for failure of primary endodontic treatment. Med Forum 2018;29(10):68-71.
3. Hybowski EA, Glickman GN, Patel Y, Fleury A, Solomon E, He J. Clinical outcome of non-surgical root canal treatment using a single-cone technique with endosequencebioceramic sealer: a retrospective analysis. J Endod 2018;44(6):941-5.
4. Alfawaz H, Alqedairi A, Alkhayyal AK, Almobarak AA, Alhusain MF, Martins JN. Prevalence of C-shaped canal system in mandibular first and second molars in a Saudi population accessed via cone beam computed tomography: a retrospective study. Clin Oral Investig 2019;23(1):107-12,
5. Mohammadi Z, Giardino L, Mombeinipour A. Antibacterial substantivity of a new antibiotic-based endodontic irrigation solution. Aust Endod J 2012;38:26-30.
6. Fulzele P, Baliga S, Thosar N, Pradhan D. Evaluation of calcium ion, hydroxyl ion release and pH levels in various calcium hydroxide based intracanal medicaments: An in vitro study. Contemp Clin Dent 2011;2(4):291.
7. Schein B, Schilder H. Endotoxin content in endodontically involved teeth. J Endodont 2006; 32(4):293-5.
8. Carrilho MR, Carvalho RM, Sousa EN, Nicolau J, Breschi L, Mazzoni A, et al. Substantivity of chlorhexidine to human dentin. Dent Materials 2010;26(8):779-85.
9. Singh RD, Khatter R, Bal RK, Bal CS. Intracanal medications versus placebo in reducing postoperative endodontic pain. A double-blind randomized clinical trial. Braz Dent J 2013;24:25-9
10. Akbar I. Radiographic study of the problems and failures of endodontic treatment. Int J Health Sci 2015;(2):111-8.
11. Schafer E, Bossmann K. Antimicrobial efficacy of chloroxylenol and chlorhexidine in the treatment of infected root canals. Am J Dent 2001;14:233-7.
12. Krithikadatta J, Indira R, Dorothykalyani AL. Disinfection of dentinal tubules with 2% chlorhexidine, 2% metronidazole, bioactive glass

when compared with calcium hydroxide as intracanal medicaments. J Endod 2007;33:1473-6.
13. Al-Negrish AR, Habahbeh R. Flare up rate related to root canal treatment of asymptomatic pulpally necrotic central incisor teeth in patients attending a military hospital. J Dent 2006;34: 635-40.
14. Ghoddusi J, Javidi M, Zarrabi MH, Bagheri H. Flare-ups incidence and severity after using calcium hydroxide as intracanal dressing. NYSDJ 2006;26: 24–28.
15. Udoye C, Aguwa E. Flare-up incidence and related factors in adults. J Dent Oral Hyg 2010;2:19-22.
16. Gomes BPFA, Martino FC, Vianna ME. Comparison of 2.5% sodium hypochlorite and 2% chlorhexidine gel on oral reduction from primary infected root canals. J Endod 2009;35:1350-3.
17. Gama TG, de Oliveira JC, Abad EC, Rocas IN, Siqueira JF. Postoperative pain following the use of two different intracanal medications. Clin Oral Investig 2008;12:325-30.
18. Yoldas O, Topuz A, Isci AS, Oztunc H. Postoperative pain after endodontic retreatment: Single-versus two-visit treatment. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2004;98: 483-7.
19. Delgado RJR, Gasparato TH, Sipert CR, Pinheiro CR, Moraes IG, Garcia RB, et al. Antimicrobial effects of calcium hydroxide and chlorhexidine on Enterococcus faecalis. J Endod 2010;36:1389-13.