



CODEN [USA]: IAJPBB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

Available online at: <http://www.iajps.com>

Research Article

COMPARISON OF QMIX AND BIOPURE AS A FINAL RINSE TO CONTROL THE POSTOPERATIVE PAIN AFTER SINGLE VISIT ENDODONTICS

Dr. Amna Memon¹, Dr. Feroze Ali Kalhoro², Dr. Seema Naz³, Dr. Kelash Kumar⁴

1. BDS. MSc (Trainee) Operative Dentistry, Liaquat University of Medical and Health sciences, Jamshoro
2. BDS. FCPS Professor Operative Dentistry, Liaquat University of Medical and Health Sciences, Jamshoro
3. BDS. MSc Associate Professor Oral Biology, Liaquat University of Medical and Health Sciences, Jamshoro
4. BDS.FCPS, Assistant Professor Operative Dentistry, Baqai Dental College, Karachi

Abstract:

OBJECTIVE: The objective the study was to compare the effectiveness of Q MIX and BioPure (MTAD) as a final rinse to control the postoperative pain after one visit root canal treatment. **DESIGN:** Comparative experimental study. **METHODOLOGY:** Total 96 patients included in this study. Preoperative pain score was recorded on VAS. There were 3 groups, in Group A, Q Mix used as a last rinse, in Group B BioPure (MTAD) used as final irrigant and in Group 3 normal saline was used as final rinse after complete canal preparation and before obturation of root canals and teeth restored. Postoperative pain was recorded after 24 hours and 7 days on VAS. Data was enrolled & analyzed by Statistical Package Social Sciences Version-20. **RESULTS:** Patients included in the study having mean age were 36.47 ± 10.552 . The males and females were 49% and 51% respectively. The patients presented with pre-operative pain status as moderate and severe pain on VAS 29% and 71% respectively. Post-operative pain status after 24 hours recorded in all groups was mild in 46%, moderate in 43% and severe in 12% cases. Postoperative pain after 7 days was mild in 44%, moderate in 8% and no pain 48% of cases. The association between treatment groups and pain after 24 hours was recorded as no severe pain was present in Q Mix and BioPure group and was present in 11% of cases of normal saline group, with significant difference between treatment and control group. On association after 7 days there was no pain in 20% and 18% cases of Q Mix and BioPure and in normal saline group mild and moderate pain was present in 16% and 8% of cases. **CONCLUSION:** It is concluded that Q Mix has proved itself as an effective final irrigant as compared to BioPure. Both Q Mix and BioPure has reduced rate of postoperative pain than control group over 7 days of follow up period, when used as final irrigation material in single visit root canal treatment.

KEY WORDS: BioPure, Q Mix, single visit root canal treatment, Postoperative Pain

Corresponding author:**Dr. Kelash Kumar**

BDS.FCPS

Assistant Professor Operative Dentistry

Baqai Dental College, Karachi

Email: drkelash25@gmail.com

Cell# +923003091110

QR code



Please cite this article in press Kelash Kumar *et al.*, *Comparison Of QMIX And Biopure As A Final Rinse To Control The Postoperative Pain After Single Visit Endodontics.*, *Indo Am. J. P. Sci.*, 2019; 06(09).

INTRODUCTION:

Root canal treatment (RCT) is the preferred treatment modality for the root canal infections, which involves chemo mechanical procedures with removal of diseased tissue and shaping of the root canal space is performed to create the space for the placement of a biocompatible material that provide the three dimensional seal.¹

Endodontic treatment can often be performed in either one or two appointments. Single Visit endodontic treatment means procedure completed in one visit, having many advantages like reducing the number of procedures, including additional local anesthesia, rubber dam placement and subsequent gingival trauma, relocating canal irregularities and root canal anatomy. Furthermore it reduces the risk of loss and leakage of temporary restorations, thus decreasing the risk of coronal leakage.^{2,3} It prevents recontamination of canals, well agreed upon by patients and a faster treatment protocol.⁴ On the other hand there is a large list of drawbacks of multiple-visits RCT i.e. risk of reinfection of root canal space via leaky temporary restorations or because of fracture of temporary restorations during inter-appointment periods and greater risk of postoperative pain occurrence.⁵ Therefore, most of the patients choose the extraction of their teeth to avoid such lengthy and multiple visits-RCT.⁶

The major issues in single-visit endodontics are occurrence of postoperative pain and healing of peri-apical area after treatment.⁷

A very interested topic in endodontics is the incidence and management of pain. However, the post-operative pain related to endodontic therapy is a poor indicator outcome.⁸ The postoperative pain after single visit RCT could be due to inadequate removal of canal bacteria and their byproducts, due the irregularities and complex anatomy of root canal.^{9,10} It has been reported that the inter appointment antimicrobial dressing is used to achieve adequate removal of bacteria before the canal is obturated in multiple visit protocol of RCT,^{11,12} whereas recently various irrigants solutions have been used to eradicate the bacteria during single visit treatment.¹³ A newly introduced endodontic irrigant, which removes smear layer removal and with additional anti-microbial properties. It contains ethylene di amine tetra-acetic acid (EDTA), Chlorohexidine (CHX) and a Detergent.¹⁴ Another novel product, BioPure (Mixture of tetracycline acid and detergent, MTAD) is a mixture of tetracycline isomer (doxycycline), citric acid and a

detergent and is very effective in smear layer removal with antimicrobial activity.¹⁵

The purpose of this study is to compare the clinical effect of Q Mix and Bio Pure (MTAD) in reducing postoperative pain after using as a final rinse in single visit RCT, this will validate the claim of using these solutions as a final rinse and will be beneficial for the patients in reducing pain which is common complication of single visit endodontics. Moreover, we will be able to recommend the choice of material as a final rinse in single visit root canal therapy.

METHODOLOGY:

A randomized controlled trial was conducted in department of operative dentistry, Liaquat University of medical and health sciences Jamshoro, from 1st February 2018 to 31st July 2018. Total sample size was 96 (32 in each group) calculated by using Raosoft sample size calculator, using; Margin of error 5%, Confidence level 95% and Response distribution 90% (90% patients with no pain after 7 days).

After taking consent, patients included in the study were either gender, healthy patients of 18 years to 60 years of age and all teeth require primary endodontic treatment with diagnosis of Pulpal Necrosis. Patients excluded who have, teeth with periapical disease such as periapical abscess, symptomatic or asymptomatic apical periodontitis, periodontally unstable teeth and patients taking any medicine specially analgesic and antibiotic. Before starting the treatment procedure, preoperative pain score was recorded using VAS scale. After local anesthesia with lidocaine 2% with adrenaline 1:80,000 teeth were isolated with rubber dam and access was gained and working length was taken with apex locator and verified by radiograph. Root canals with were prepared with protaper rotary file system with simultaneous irrigation of 5.25 % NAOCL.

Patients were divided in three groups on basis of lottery method 32 in each group. In **Group A** last rinse of the prepared root canal performed with Q mix (DENTSPLY, Tulsa Dental, Specialties) for five minutes after using normal saline as an irrigant to prevent formation of parachloroaniline (PCA) and in **Group B** with BioPure (DENTSPLY, Tulsa Dental, specialties) used as final rinse for five minutes and in **Group C** (control group) no any irrigant used for the final irrigation.

Paper points were used to dry the canal and obturated with single cone of standard manufactured gutta percha of protaper system. Canal orifice sealed with

glass ionomer cement and temporary restorative material placed.

The level of pain was measured postoperatively 24 hours and on 7th day postoperatively using visual Analog Scale of 10 ml. (0:no pain 1-3 : mild pain 4-7: moderate pain and 8-10: severe pain). On 7th day of follow up permanent restoration placed.

Data was analyzed using SPSS version 16. Mean and standard deviation was calculated for quantitative variables like age. Frequency and percentage were calculated for qualitative variables like gender, preoperative and postoperative pain and effectiveness. Chi square test was applied by taking $P \leq 0.05$ as a significant to compare the effectiveness of groups.

RESULTS:

The mean age of patients was 36.47 ± 10.52 , with minimum value 19 and maximum value 60. (Table-1)

The male and female were 49% and 51% respectively as shown in figure-1

Preoperative pain score recorded on visual analogue scale as shown in table -2

Postoperative pain score after 24 hour in each group were recorded as shown in table-3

Postoperative pain recorded on VAS after 7 days given in table-4

Association between treatment groups and postoperative pain after 7 days as shown in table-5

Association between treatment group and effectiveness as shown in table-6

Table-1: Age Distribution

	N	Minimum	Maximum	Mean	Std. Deviation
AGE	96	19	60	36.47	10.552

Figure-2: Gender Distribution

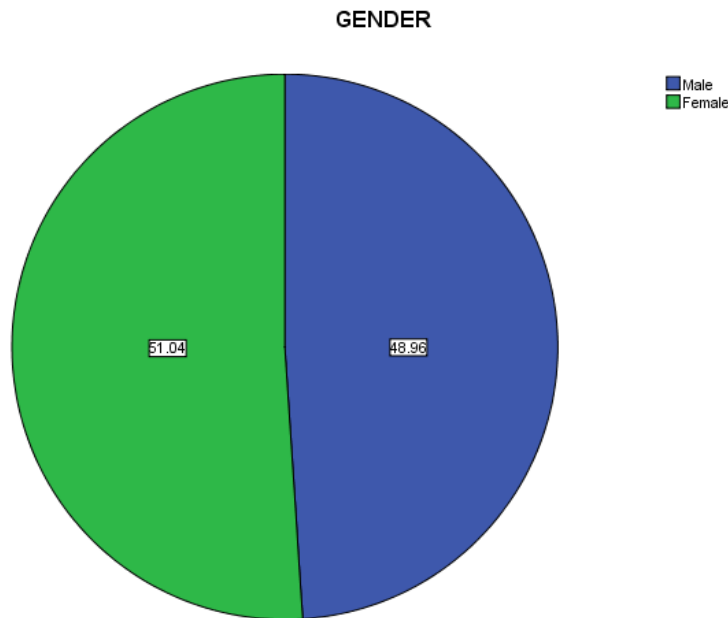


Table-2: Pre-Operative Pain Status

	Frequency	Percent
Moderate Pain	28	29.2%
Severe Pain	68	70.8%
Total	96	100.0

Table:3- Postoperative Pain Status After 24 Hour

	Frequency	Percent
Mild Pain	44	45.8%
Moderate Pain	41	42.7%
Severe Pain	11	11.5%
Total	96	100.0

Table: 4- Postoperative Pain Status After 7 Days

	Frequency	Percent
No Pain	46	47.9%
Mild Pain	42	43.8%
Moderate pain	8	8.3%
Total	96	100.0

Table-5: Association Between Treatment Groups and Postoperative Pain After 7 Days

T_GROUP	P_OP_7DAYS			Total	P value
	No Pain	Mild Pain	Moderate pain		
Q Mix	20	12	0	32	0.001
BioPure	18	14	0	32	
Normal Saline	8	16	8	32	
Total	46	42	8	96	

Table-6: Association Between Treatment Groups and effectiveness

T_GROUP	EFFECT		Total	P value
	Positive effect	Negative Effect		
Q Mix	20	12	32	0.006
BioPure	18	14	32	
Normal Saline	8	24	32	
Total	46	50	96	

DISCUSSION:

In dentistry oral health quality of life and postoperative quality of life are two main sources to assess quality of life.^{16,17} Postoperative quality of life is the subjective perception after treatment and determines the disturbances in routine activities of individual like speaking, eating, social relations.¹⁸

Management of pain associated with endodontic diagnosis is routine practice of almost every dentist. Root canal treatment is used to manage such case, but postoperative pain is common complication of endodontic treatment and is predicted by preoperative factors such as preoperative pain and diagnosis, sex, age, techniques used in treatment and clinician expertise.^{19,20}

Postoperative pain caused by remaining bacteria which cannot be removed by chemo mechanical preparation of root canal space. To remove these bacteria various methods have been used such as intracanal medicaments, different shaping techniques with NiTi rotary instruments and irrigation protocols.

The irrigants were compared in this study with single visit root canal protocol to control postoperative pain namely Q Mix, BioPure and normal saline.

Mean age of patients included in study were 36.47 ± 10.552 with minimum age 19 and maximum age 60 years, among which 51% were female and 49% were male. Preoperative pain reported by patient was moderate and severe pain 29% and 71% respectively.

Postoperative pain after 24 hour in all groups was mild, moderate and severe pain 46%, 43% and 12 % respectively, thus present study showed the significant difference between Q Mix, BioPure and normal saline. Finding of this study is that use of final rinse in single visit endodontics reduces occurrence of postoperative pain. This lies in the agreement with the study by Moskow et al²¹ who reported that 84% of individuals have reduce rate of postoperative pain after one day. In another data by Chance et al, 63 percent of the patients had no pain postoperatively after 24 hours.²²

In this present study postoperative pain after 7 days was reported as no pain, mild pain and moderate pain 48%, 44% and 8% respectively. In present study, preoperatively pain score was high and post-

operatively after 24 hours it decreased and after 7 days there was no severe pain in any of the patient, the study results proposed that use of Q Mix and BioPure as a final rinse in SVE can reduce post-operative pain after 7 days with significant effect having P value 0.001 which proved that these both irrigant can be used as a method of reducing postoperative pain in single visit endodontic treatment protocol. Occurrence of mild and moderate post-operative pain may be due to the treatment accomplished in single visit or possibly aseptic techniques and protocols may have impact on pain and treatment. This lie in the agreement proposed by Yodas O et al who studied that pain is more common after single visit root canal treatment²³

Postoperative pain after 24 hours in group A patients in which Q Mix was used as final rinse was mild and moderate 17% and 15% respectively and no patient has reported severe pain in this group and in Bio Pure group pain was mild and moderate 15% and 17% respectively and no patient was with severe pain but in normal saline postoperative pain was severe, moderate and severe 11%, 9% and 12%, thus present study showed that use of Q Mix and BioPure as final irrigant has more reduced rate of postoperative pain as compare to control group of normal saline. Q Mix and BioPure both have insignificant difference on reduction of postoperative pain when used as final irrigant. Torabinejad et al found MTAD was effective as antibacterial against many microorganisms responsible for endodontic infections and may the cause of postoperative pain^{24,25}

The combination of 1.3% NaOCl as an irrigant throughout the procedure and MTAD as a last rinse has been significantly effective antibacterial and reduces postoperative pain suggested by Shabahang and Torabinejad in their studies.²⁶

Q Mix has antimicrobial activity when used as a final rinse and reduces postoperative pain when compared to control normal saline group additionally, this lie in agreement with study of Wang Z et al.²⁷

It is reported that females may have higher incidence of postoperative pain as compared to males which are in contrary with other studies that female patients are more sensitive and have lower pain threshold than male patients. This could be due to difference of hormonal level between both genders.

In this study when association was checked between all three irrigants and effectives on postoperative pain, there was no significant difference between both Q Mix and BioPure with P value 0.006, but significant

difference was found with normal saline group and effectiveness of group, it proved that use of final irrigant reduces pain when used in single visit root canal protocol.

LIMITATIONS

The limitation of the study was small sample size selected for each group which may need to be evaluated on further larger scale.

CONCLUSION:

This study has shown encouraging results regarding use of Q Mix and BioPure as a final irrigant when used in single visit root canal treatment. In this study Q Mix has proved itself as an effective final irrigant as compared to BioPure. Moreover both Q Mix and BioPure has reduced rate of postoperative pain then control group over 7 days of observation period. Further study is required to assess further detailed assessment of these irrigants for their effectiveness on postoperative pain when used in single visit root canal treatment.

CONFLICT OF INTEREST

Authors declared no conflict of interest

REFERENCES:

1. Udoye Ch, Aguwa E. Flare - up incidence and related factors in adults. *J.Dent.Oral Hyg.* 2010; 2:19-22.
2. Figini L, G Lodi, Gorni F and Gagliani M. Single versus multiple visits for endodontic treatment of permanent teeth. *Cochrane Database Syst. Rev.* 2007; 4.
3. J W Field et al. A clinical radiographic retrospective assessment of the success rate of single visit root canal treatment. *Int endodontic J.*2004;37:70-82.
4. Londhe Col S M, Garge B H G. Single Visit Root Canal Treatment. *MJAFI.* 2007; 63 : 273-274
5. C Keskin, E O Demiryurek, T Ozyurek. Postoperative Pain after Single-Versus-Multiple Visit Root Canal Treatment in Teeth with Vital or Non Vital Pulps in a Turkish Population. *Asian Journal of Scientific Research.* 2015;8(3):413-420.
6. Weiger R, Rosendahl R, Lost C. Influence of calcium hydroxide intra-canal dressings on the prognosis of teeth with endodontically induced periapical lesion. *Int Endod J* 2000; 33:219-26.
7. Yazd ZM, Isfahan AF, Yazd MT. One-visit versus multiple-visit endodontic therapy- a review. *Int DentJ* 2006;56:289-93.
8. Wong AW, Zhang C, Chu CH. A systematic review of nonsurgical singlevisit versus multiple-

- visit endodontic treatment. *Clin Cosmet Investig Dent* 2014; 6: 45–56.
9. Paque F, Ganahl D, Peters OA. Effects of root canal preparation on apical geometry assessed by micro-computed tomography. *J Endod* 2009;35:1056–9.
 10. Ricucci D, Siqueira JF Jr. Fate of the tissue in lateral canals and apical ramifications in response to pathologic conditions and treatment procedures. *J Endod* 2010;36:1–15.
 11. Sathorn, C., P. Parashos and H. Messer. Australian endodontist's perceptions of single and multiple visit root canal treatment. *Int. Endodontic J.* 2009; 42: 811-818.
 12. Vera J, Siqueira J F, Ricucci D, Loghin S, Fernandez N, Flores B and Cruz A G. One- versus Two-visit endodontic treatment of teeth with apical periodontitis: A histobacteriologic study. *J. Endod.* 2012; 38: 1040-1052.
 13. Hulsmann M, Heckendorff M, Lennon A. Chelating agents in root canal treatment: mode of action and indications for their use. *Int Endod J* 2003;36:810-830.
 14. Dai L, Khechen K, Khan S, *et al.* The effect of QMix: An experimental antibacterial root canal irrigant on removal of canal wall smear layer and debris. *J Endod* 2011;37:80-84.
 15. Torabinejad M, Shabahang S, Aprecio RM, Kettering JD. The antimicrobial effect of MTAD: an in vitro investigation. *J Endod* 2003;29:400–3.
 16. Gatten DL, Riedy CA, Hong SK, Johnson JD, Cohenca N. Quality of life of endodontically treated versus implant treated patients: a University-based qualitative research study. *Journal of Endodontics.* 2011;37, 903–9.
 17. Liu P, McGrath C, Cheung GS. Improvement in oral health-related quality of life after endodontic treatment: a prospective longitudinal study. *Journal of Endodontics.* 2014a; 40, 805–10.
 18. Del Fabbro M, Corbella S, Ceresoli V, Ceci C, Taschieri S. Plasma rich in growth factors improves patients' postoperative quality of life in maxillary sinus floor augmentation: preliminary results of a randomized clinical study. *Clinical Implant Dentistry and Related Researches* 1.2015;708–16.
 19. Pak JG, White SN. Pain prevalence and severity before, during, and after root canal treatment: a systematic review. *Journal of Endodontics.* 2011;37, 429–38.
 20. Hamasha AA, Hatwsh A. Quality of life and satisfaction of patients after nonsurgical primary root canal treatment provided by undergraduate students, graduate students and endodontic specialists. *Int Endo J.* 2011;46, 1131–9.
 21. Moskow A *et al.* Intracanal use of a corticosteroid solution as an endodontic anodyne. *Oral Surg Oral Med Oral Pathol* 1984;58(5):600-4.
 22. Chance K, Un L, Shoulin F, Skdbner J. Clinical trial of intracanal corticosteroid in root canal therapy. *J Endod.* 1987;13:466-8.
 23. Yodas 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;98:483-86.
 24. Torabinejad M, Shabahang S, Bahjri K. Effect of MTAD on postoperative discomfort: a randomized clinical trial. *J Endod.* 2005; 31:171-6.
 25. Torabinejad M, Shabahang S, Aprecio R M, Kettering JD. The antimicrobial effect of MTAD: an in vitro investigation. *J End* 2003;29(6):400-3
 26. Shabahang S, Torabinejad M. Effects of MTAD on enterococcus faecalis contaminated root canals of extracted human teeth. *J Endo.* 2003;29(9):576-9
 27. Wang Z, Shen Y, Haapasalo M. Effectiveness of endodontic disinfecting solutions against young and old *Enterococcus faecalis* biofilms in dentin canals. *J Endod.* 2012; 38:1376-9.