

Comparison of Post-Operative Pain Frequency After Single visit and Multiple visit Root Canal Treatment in Non-Vital Teeth



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OBJECTIVES: Root canal treatment (RCT) is performed to get rid of pain resulting from the infection in the tooth. It is a safe procedure with high success rate. One of the main issues with root canal treatment is post-operative pain. There are many factors which can cause pain and distress to patients. If the clinician follows the guidelines properly and use the anxiety reduction protocol, then the procedure is not painful. RCT can be performed in multiple visits or it can be done in single visit. Present research was conducted to compare the single visit versus multiple visits endodontic treatment in teeth with pulpal necrosis in terms of

post-operative pain frequency.

METHODOLOGY: This study was a randomized controlled trial conducted at Department of Operative Dentistry, Fatima Memorial Hospital, Lahore, over a period of six months. Total number of participants was 302 and the teeth were lower and upper first and second molars with pulp necrosis and they were equally assigned in two groups of 151 with equal number of men and women. Single visit RCT was done in Group A patients, in which the endodontic procedure was performed in one day and multiple visit RCT was done in Group B, in which endodontic treatment was done in two or more visits.

RESULTS: In necrosed teeth single visit endodontic treatment 20.5(%) resulted in less frequent post-operative pain than in multiple visit endodontic treatment (26.5%).

CONCLUSION: Single visit endodontic treatment is a better technique in terms of pain control as compared to multiple visit in teeth with pulp necrosis.

KEYWORDS: Endodontics, Non-vital teeth, Post-operative pain, single visit root canal treatment, multiple visit root canal treatment.

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INTRODUCTION

The most common concern for the patients is pain which causes them to visit the dentist and it may be due to trauma or caries.^{1,2} When tooth is grossly

carious or when the dental pulp is beyond the stage of reversible damage or when the patient is suffering from pain, patient is usually left with two options, either go for extraction of that tooth or a root canal treatment.³ In root canal treatment, healing of peri- radicular tissues is promoted by eradicating the pulpal and peri-radicular disease with the help of mechanical treatments and biologically acceptable chemicals. Endodontic treatment is performed to control pain and to get rid of infection and all sign and symptoms from teeth. If the treatment itself creates pain then it becomes distressing for both patient and clinician.^{4,5} Therefore, treatment with lower likelihood of pain is considered as treatment of choice.

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One of the main issues with root canal treatment is post-operative pain.^{4,5} The factors responsible for postoperative pain are not clear. Pain is determined by many factors such as apprehension, pain before the initiation of treatment, patient's response to painful stimuli, remnants of pulpal tissue, irritation of the peri-radicular tissues.⁶⁻⁷ It is sensible to assume that many patients suffer from anxiety in expectancy of the pain that is expected during conventional root canal treatment. This anxiety increases with the local inflammatory reaction to lessen the pain threshold, which results in more intense pain.⁸ It is reported that a high level of anxiety is a predictor of post-operative pain.⁹

Sadaf et al reported 1.9%- 48% prevalence of pain after root canal treatment.⁴ Choice between one versus two visit endodontic therapy depends on the lesser occurrence of post-operative pain. Yingying et al. found that multiple-visit RCT resulted in more frequent (37%) pain after RCT (immediate to 72 hours) than those with single visit RCT (26%).¹⁰ However, Wan et al. concluded the difference in severity of pain was insignificant following either of the procedures.^{11,12} Hameed et al. conducted a similar study in Khartoum and reported no significant difference with pain incidence of 9.4% in single visit and 11.4% in multiple visit.^{13,14} In order to duplicate this study in Pakistani population a pilot study carried in our department of operative dentistry, study has been planned to compare the single visit versus. So, the results of this study will help in time saving and less painful RCT strategy in term of post-operative pain management.

METHODOLOGY

This randomized control trial was done in out patients department of Operative Dentistry at Fatima Memorial Hospital, in which all the participants were randomly allocated in both groups. All the patients agreed and their written informed consent was obtained. Participants with non-vital teeth were considered for this study. Socio-demographic data and symptoms were recorded, subjects were examined and relevant investigations (vitality tests and radiographs) carried out. Total 302 participants with pulp necrosis were randomly divided in two groups, Group A and Group B, with equal number that is 151 in each group. Group A the treatment was done in one visit whereas two visit treatment was carried out for group B.

Local anesthesia(1.8ml 2% Lignocaine with 1:10000 epinephrine) was administered in both groups. Standard access cavity preparation followed by rubber dam isolation and pulp extirpation. After the confirmation of canal patency and working length radiograph, preparation was done using both hand files and rotary-driven instruments. Lubrication

was done using 17% EDTA gel. 2.5% NaOCl was used as an irrigant. Cleaning and shaping of teeth was done till working length in first visit and paper points were used for drying of the canals. Obturation was done for teeth in Group A with gutta-percha points along with sealing material and definitive restoration was placed in that particular visit. In Group B after the canal preparation non-setting calcium hydroxide paste was placed along with spacer in the canal and tooth was restored with a minimum of 3.0mm Cavit. Patients in Group 2 were recalled after 1 week and the obturation technique same as Group 1 was followed in the second visit. After obturation, the patients in both the groups were recalled after 48 hours and assessed using visual analogue scale regarding presence and absence of post-operative pain. A value of 0-1 on VAS scale was considered as absence of pain.

Data was analyzed using SPSS-20. For descriptive analysis, mean and standard deviation of data were calculated for variables of age, BMI and VAS score. Whereas frequency and percentages were determined for categorical variables including gender and educational status. The occurrence of post-operative pain for both groups was calculated using chi-square test. A p value of 0.05 or less was considered as significant. After data stratification, the chi-square was conducted with p value <0.05 deemed the significant value.

RESULTS

This single blinded endodontic treatment was carried out with 302 participants with pulp necrosis in lower and upper first molar. Total 302 participants were equally assigned in 2 groups. In first group (A) there were 151 participants, including 82 females and 69 males. In group B there were also 151 patients including 80 females and 71 males with age ranged from 20-40. (Table 1) Mean age 29 years with Standard Deviation of 5.67. Table 1 shows the frequency of post-operative pain for both groups with P value of 0.050,

Table 1: Post-operative pain score in both procedures

| Procedure | Pain | | Total | P- value |
|----------------|----------------|----------------|---------------|----------|
| | NO pain | pain present | | |
| Single visit | 89 (29.5%) | 62 (20.5%) | 151 (50%) | 0.050 |
| Multiple visit | 71 (23.5) | 80 (26.5%) | 151 (50%) | |
| Total | 160 (53.0%) | 142 (47.0%) | 302 (100%) | |

Table 2: Effect of Gender Post-Operative pain Frequency after Single and Multiple visit RCT

| Gender | | | Count | pain | | Total | P Value |
|--------|-----------|----------------|------------|---------|--------------|-------|---------|
| | | | | NO pain | pain present | | |
| Female | Procedure | single visit | 45 | 37 | 82 | 0.432 | |
| | | | % of Total | 27.8% | 22.8% | | 50.6% |
| | | Multiple visit | 38 | 42 | 80 | | |
| | | | % of Total | 23.5% | 25.9% | | 49.4% |
| | Total | | 83 | 79 | 162 | | |
| | | | % of Total | 51.2% | 48.8% | | 100.0% |
| Male | Procedure | single visit | 44 | 25 | 69 | 0.043 | |
| | | | % of Total | 31.4% | 17.9% | | 49.3% |
| | | Multiple visit | 33 | 38 | 71 | | |
| | | | % of Total | 23.6% | 27.1% | | 50.7% |
| | Total | | 77 | 63 | 140 | | |
| | | | % of Total | 55.0% | 45.0% | | 100.0% |

Table 3: Age distribution of subjects

| Age groups | Procedure | | Total | Frequency | P-Value |
|------------|---------------|----------------|----------------|-----------|---------|
| | single visit | Multiple visit | | | |
| 20-26 | 59 (19.5%) | 49 (16.2%) | 108 (35.8%) | 35% | 0.484 |
| 27-32 | 53 (17.5%) | 58 (19.2%) | 111 (36.8%) | 36% | |
| 33-40 | 39 (12.9%) | 44 (14.6%) | 83 (27.5%) | 27% | |
| Total | 151 (50%) | 151 (50%) | 302 (100%) | | |

showing the frequency of pain after treatment is higher in group B patients.

The frequency of pain after completion of treatment was not significant in case of single visit (P value 0.432) and multiple visits RCT (P value 0.043) based on gender distribution (P 0.908) as shown in Table no 2.

The difference in frequency of pain after treatment in either groups was not significant based on age (p=0.484) (Table 3)

DISCUSSION

This study planned to find a more effective root canal treatment modality for post-operative pain control and patient

management. The results of present study showed that the frequency of post-operative pain in one mutple visits had significant difference in non-vital teeth (p value 0.05). Previous studies showed conflicting results regarding the occurrence of pain after root canal treatment in either groups. Omer et al. concluded that patients undergoing endodontic treatment in one visit experience less postoperative pain as compared to those undergoing it in two visits.¹⁰ Similarly Risso reported more pain in two visit endodontic treatment as compared to one visit treatment and therefore results showed that pain right after the completion of one visit root canal treatment was less frequent.² The results of present study were in harmony with these studies. Wan et al. concluded no significant difference in intensity of pain after endodontic therapy done in single-sitting and numerous sittings in non-vital anterior teeth.¹² The present study showed different outcomes from the study by Wan because Wen performed RCT in vital teeth while present study conducted RCT in necrosed teeth. Wan used single rooted teeth in his study and present study used multi-rooted teeth.¹² Abdel et al. conducted a similar study in Khartoum and reported no significant difference with pain incidence of 9.4% in single visit and 11.4% in multiple visit.¹³ This study was different than present as this study included patients in age range 18-62 while present study included patients 20-40 years. Obturation technique in this study was cold lateral condensation while present study used single cone technique. Other variables that showed influence on pain after endodontic treatment are sex distribution, age and techniques for cleaning and shaping, mechanical and chemical injury to pulp and peri- radicular tissues, biological factors and the type of intra-canal medication.^{15,16}

To study the effect of age, the age group of the sample in the study was confined to 20 to 40 years. It was found that the age did not showed any significant effect on frequency of pain after treatment (p = 0.484).To control the effect of gender on pain after treatment, equal number of participants for each gender was chosen. It was found that the gender didn't have effect on occurrence of pain after endodontic treatment with p value > 0.05 (table 2). Previous studies used cold lateral condensation technique for obturation. In the present study, single cone technique was used. This technique has been shown to result in significantly less apically extruded debris resulting in less post instrumentation pain. To the best of our knowledge, we were the first researcher to compare the frequency of pain after one visit and multiple visits root canal therapy in teeth with pulp necrosis in Pakistan. Less frequent pain after endodontic treatment after one visit root canal treatment will add to the literature about the better, time saving and less painful RCT strategy in term of post- operative pain management.

CONCLUSION

This study concluded that pain after single visit endodontic treatment is less frequent than multiple visit endodontic treatment in teeth with pulp necrosis.

CONFLICT OF INTEREST

There is no difference of opinion in this research

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