ASSESSMENT OF POST-OBTURATION PAIN: SINGLE VS TWO VISITS ROOT CANAL TREATMENT

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OBJECTIVE: The objectives of this study was to evaluate the severity of post-obturation pain following single visit and two visit root canal treatment using VAS (Visual Analogue Scale) and to determine the correlation between pre-obturation and post-obturation pain.

METHODOLOGY: This was a Quasi Experimental study that was conducted in the Operative Dentistry Department of Altamash Institute of Dental Medicine was done in duration of six months. Sixty patients were selected. After access preparation, working length was determined by Periapical radiograph. Canal preparation was done by Step-Back technique using K-files and obturation was done by lateral condensation of gutta percha. In two visit group, canal preparation was completed in first visit and obturation was carried out at a later date. Data analysis was performed through SPSS version-13.0. Repeated measure analysis of variance (ANOVA), Chi-square and Pearson's correlation (r) were used with p-value <0.05 considered as significant.

RESULTS: After postoperative 4 hours, the mean VAS in single root canal visit group was 4.7±2.96 and 2.8±1.73 in two root canal visit group. The mean VAS score of two visits for postobturation pain after 12 and 24 hours was less in as compared to one visit treatment. Data showed direct correlation in pre-operative pain and post-obturation pain in both groups.

CONCLUSION: No advantage was observed when one-visit and two-visit root canal treatment were compared regarding post-obturation pain in the initial 4 hours, but two-visit root canal treatment showed better results in terms of post-obturation pain after 12 and 24 hours. Though the present study reported favourable results in two-visit root canal treatment regarding post-obturation pain.

KEY WORDS: One visit endodontic treatment, Pre-operative pain, Post-obturation pain, Two visit endodontic treatment, Visual Analogue Scale.


INTRODUCTION

Odontogenic pain is a primary reason for a patient to seek conventional endodontic treatment. Root canal treatment or endodontic treatment is a common procedure in dentistry. Pain and discomfort are often associated with root canal treatment. When the treatment itself appears to initiate the onset of pain and/or swelling, the result can be very distressing to both the patient and the operator.\(^1\,^2\).

The general population generally regards root canal treatment as a painful and unpleasant experience. Usually, the root canal treatment relieves the pain symptoms; however, pain may persist for a few days following the treatment. Post obturation pain after nonsurgical root canal treatment has been reported to range from approximately 3% to more than 50%.^3^,^4^.

Some authors concluded in their study that there was no difference in the post-operative pain between patients treated in one-visit and patients treated in two-appointments. The majority of patients in both groups reported no pain or only minimal pain within 24 to 48
hours of treatment.

While some researchers presented a higher incidence of postobturation pain following single visit root canal treatment. Oginni & Udoye reported higher incidences for post-obturation pain and flare-ups following the single visit procedures, this study also showed that teeth with vital pulps reported the lowest frequency of post-obturation pain (48.8%), while those with non-vital pulps were found to have the highest frequency of post-obturation pain (50.3%)10. Other studies presented higher incidence of postobturation pain following two visit root canal treatment 11-14.

Certain preoperative and operative factors are associated with pain after endodontic treatment. Patients experiencing severe preoperative pain have an increased incidence of moderate to severe post-endodontic pain when compared to those having no pain prior to conventional endodontic treatment15-17. The prevalence of postobturation pain is also significantly affected by the vitality status of tooth and number of appointments, gender, tooth type, size of periapical lesion bacteriologic status, tooth position, and type of filling material showed no effect on post-obturation pain19. But the operator may induce postobturation pain by exuding instruments, debris, paper points, filling materials, or chemicals paste the root apex into the periapical tissues20. Postoperative pain was significantly associated with the obturation technique used during root canal treatment.21

The objective of this study were to determine rate and severity of postobturation pain using VAS (visual analogue scale)22 and to evaluate the relationship between pre-obturation and post-obturation pain when performing root canal treatment in single visit compare to treatment in two visits.

METHODOLOGY

Study was conducted with prior approval of the hospital ethical committee of Al tamah Institute of Dental Medicine. Patients requiring endodontic treatment were included in the study. Verbal informed consent was taken from the patients. History, clinical examination and radiographic investigation were done. Patients requiring single visit treatment were included in Group 1(N=30) and patients received two visit treatments in group 2(N=30). For each tooth treated, a recorded data including pulp vitality status, the presence or absence of preoperative pain and degree of postobturation pain at 6, 12 and 24 hours respectively were recorded by using a visual analogue scale (VAS). The patient were given the VAS form, along with a stamped, addressed envelope for return of the form after 24 hours. Patients were contacted by telephone at 4, 12 hours and again after 24 hrs to remind those to complete the VAS form.

The standard procedure for both groups at the first appointment included local anesthesia, rubber dam isolation, caries excavation, and standard access preparation. The working length was determined radiographically from a coronal reference to a distance 1 mm short of the radiographic apex. The root canals were cleaned and shaped using the step-back technique, hand files, and Gates-Glidden drills (Dentsply/Maillefer, Ballaigues, Switzerland). The teeth were then randomly assigned to two groups as follows: group 1, single-visit therapy each root canal was dried with paper points, then filled with gutta-percha points sealed with Sealapex root canal sealer (Sybron Endo, CA, USA) using the lateral condensation technique. Group 2, multi-visit therapy the teeth were prepared as in group 1, but were not obturated. Chemomechanical preparation was completed in the first visit using the same technique for all cases. A sterile cotton pellet was placed in the pulp chamber, and the access cavity was sealed with Provistan Temporary Restoration (Favodent, Karlsruhe, Germany). One week later, the teeth were obturated as in group 1.

Data analysis was performed through SPSS (Statistical package for social sciences) version-17.0. Quantitative response variables like age, pain score (VAS) were presented by Mean ± Standard deviation and frequencies and percentages were computed for presentation of qualitative response variables like gender, tooth status and presenting complaint. Repeated measure analysis of variance (ANOVA), Pearson’s correlation (r) and Chi-square test was applied to compare these variables between two groups. Statistical significance was taken at p < 0.05.

RESULTS

Out of 60 patients who underwent root canal, 32 (53.3%) were males and 28 (46.7%) females (M: F=1.1:1). The mean age of patients in single visit group was 31.9±12.4 years and in two visit group was 30.5±8.7 (p= 0.591). Out of 30 patients of single root canal visit, 19 (63%) had vital and 11 (37%) had necrotic tooth status while in 30 patients of two visits root canal, 22
(73.3%) had vital and 8 (26.7%) had necrotic tooth status (p=0.405). Pain was the commonest presenting compliant in the groups of single and two root canal visits respectively 56.7% and 70%, followed by food packing 26.7% and 10%, sensitivity 10% and 10% and prosthetic 6.7% and 10%(p=0.408).

The mean preoperative pain score (VAS) in the patients who underwent in the group of single root canal visit group was 2.03 ±1.27. While in the group of two visit root canal was 1.97 +1.09( p=.829). After postoperative 6 hours, the mean VAS in single root canal visit group was 1.97±1.12 and 1.20±0.71 in two root canal visit group. The attenuation in pain score after 6 hours was statistically significant in the groups of single and two root canal visits (p=0.003).

After postoperative 12 hours, the mean VAS in single root canal visit group was 1.40±1.07 and 1.03±0.66 in two root canal visit group. The attenuation in pain score after 12 hours was statistically insignificant in the groups of single and two root canal visits (p=0.117). After postoperative 24 hours, the mean VAS in single root canal visit group was 1.0±0.98 and 0.60±0.77 in two root canal visit group(p=0.085).

Statistically insignificant attenuation in postoperative pain after 12 and 24 hours was observed in both groups however the mean VAS of the group of two root canal visits remained less than that of single root canal visits group after 12 and 24 hours.

In single root canal visit group, correlation was weak positive r=0.222 and statistically insignificant (p=0.239) while in two visits root canal group, correlation was strong positive i.e. r=0.803 and also significant (p=0.001).

**Table 1**
Comparison of Pre and Post Operative Pain between Visit 1 and 2

<table>
<thead>
<tr>
<th>Number of Visit</th>
<th>Pre Operative Pain</th>
<th>Post Operative Pain 6 Hourly</th>
<th>Post Operative Pain 12 Hourly</th>
<th>Post Operative Pain 24 Hourly</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.03 ±1.27</td>
<td>1.97 ±1.13</td>
<td>1.40 ±1.07</td>
<td>1.00 ±0.98</td>
<td>0.829</td>
</tr>
<tr>
<td>2</td>
<td>1.97 ±1.13</td>
<td>1.20 ±0.71</td>
<td>1.03 ±0.67</td>
<td>0.60 ±0.77</td>
<td>0.003</td>
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<td></td>
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<td>0.117</td>
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<td>0.085</td>
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</table>

**DISCUSSION**

Debate is still ongoing among researcher and clinician concerning the effectiveness of an appointment versus multiple appointment endodontic treatment in term of post obturation pain.

Although it was found that there was no advantage for one visit or two visit root canal treatment regarding post obturation pain in initial 6 hours, but two visit root canal treatment shood better result in term of post obturation pain after 12 and 24 hours. According to Figini L et al found patients undergoing a single visit may experience slightly higher frequency of post obturation pain and are significantly more likely to take pain killers. Unlike Jalil Modaresi et al found low incidence of post obturation pain in single visit endodontic treatment as compare to two visit endodontic treatment. This has been supported by Albashaireh ZS et al also found a significantly higher incidence of postobturation pain was found in the multiple-visit group than in the single-visit group within 24 h of obturation.

Previous studies have shown that there is a strong positive correlation between pre-operative and post-obturation pain. Oginni and Udoye in their study found that for both single and multiple visit procedures, there were statistically significant correlations between pre-operative and post-obturation pain. The present study also supports this correlation, in both the single and multiple visit groups there were statistically significant correlation between pre-operative and post-obturation pain.

The limitations of this study was that VAS had been used to measure the levels of pain since there is no objective method for measuring pain, as the pain experience is very subjective and is dependent on so many factors. Therefore the ability to generalize the results is weak. However, a careful case selection and adherence to the basic principles of endodontic treatment will reduce the incidence of post-obturation pain and thus enhance a successful outcome.

And also in this study since the age, gender, pulp vitality and presenting complaint had been equally distributed in both the groups hence the effect of these factors on postobturation pain had not been identified so the influence of these factors on post obturation pain can be identified in future studies.

Hence the hypothesis of this study was not supported by the results of this study but single visit endodontic therapy has been shown to be a safe and effective alternative to multiple visit treatment, especially in communities where patients default after the first
appointment at which pain is relieved.

CONCLUSION

Although no advantage was observed when one-visit and two-visit root canal treatment were compared regarding post-obturation pain in the initial 6 hours, but two-visit root canal treatment showed better results in terms of post-obturation pain after 12 and 24 hours. Though the present study reported favourable results in two-visit root canal treatment regarding post-obturation pain. However, single visit endodontic therapy has been shown to be a safe and effective alternative to two visit treatment, especially in communities where patients default after the first appointment at which pain is relieved.

REFERENCES

22. Chapman HR, Kirby-Turner N. Visual/verbal analogue scales, examples of brief assessment methods to aid management of child and adult patients in clinical