COMPARISON OF POST OPERATIVE PAIN FREQUENCY AFTER SINGLE VISIT AND MULTIPLE VISITS ROOT CANAL TREATMENT WITH ROTARY INSTRUMENTS ON NON-VITAL TEETH

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ABSTRACT

Endodontic treatment is traditionally performed in multiple visits however, single-visit treatment has gained acceptance due to recent invention of nickel-titanium systems and improvement in irrigation and disinfection techniques. The objective of this study was to compare the frequency and severity of post-obturation pain after one-visit and two-visit root canal treatment on permanent teeth with non-vital pulps. Four hundred forty patients were divided into group 1 and 2. Single visit treatment was done in group 1 patients and two-visit treatment was performed in group 2 patients. Verbal descriptor scale (VDS) was used to measure post-operative pain. Mean pain score was 1.94 and 1.53 in group 1 and 2 respectively. The result was statistically insignificant.

Key Words: Endodontic treatment, Single-visit root canal treatment, Non-vital pulps.

INTRODUCTION

Endodontic treatment is traditionally performed in multiple visits aiming to reduce or eliminate microorganisms from root canal system before obturation. In recent years, however, single-visit treatment has gained acceptance due to recent invention of nickel-titanium systems and improvement in irrigation and disinfection techniques. Single-visit root canal treatment offers some advantages like it may prevent inter-appointment micro leakage, reduced cost, lesser use of injections and rubber-dam application etc. Still the subject of single-versus multiple-visit root canal treatment has been much debated in endodontic community. Some of the unresolved issues include different clinical outcomes, inadequate microbiological control and pain.

Fear of pain is one of the major reasons of dental apprehension and postoperative pain is unfortunately one of the primary problems in endodontic treatment. Endodontic treatment aims to eliminate all the signs and symptoms of disease process. If the treatment itself creates pain then it becomes distressing for both patient and clinician. Therefore treatment with lower prevalence of pain is considered as treatment of choice. Yingying Su et al found that patients with single-visit root canal treatment experienced short-term (immediate to 72 hours) postoperative pain less frequently (26%) than those with multiple-visit root canal treatment (37%). However, C.Wang et al concluded no significant difference in intensity of post-obturation pain following one-visit or two-visit root canal treatment on teeth with vital pulps and a single canal. Mansoor et al and Klooro et al found that it is safe to carry out single-visit root canal treatment irrespective of the pre-operative pulpal and periapical status of the pulp.

The following study is aimed to investigate whether there is any detectable difference in the frequency and intensity of post-obturation pain after single- and two-visit root canal treatment on the teeth with non-vital pulps.

METHODOLOGY

This study was conducted on patients referred to Department of Operative dentistry, Islamic international dental hospital (IIDH). An approval for the proposed study was obtained from the ethical committee of IIDH. Only the patients fulfilling the inclusion criteria were selected for the study.

An informed written consent of the patient/parent/guardian was obtained as per patient consent. Each patient was assigned by computer generated table of random number to group 1 or group 2 so that there will be n1=220 patients and n2=220 patients. All the procedures were carried out by the trainee researcher himself. Only teeth with completely formed roots,
periapical radiolucency or periodontal space widening associated with swelling or discharging sinus were selected. Root canals with calcification or resorption, pregnant, nursing or patient taking any pain medications were excluded from the study.

A preoperative periapical radiograph was taken by paralleling technique. The standard procedure for both groups at first visit was administration of local anesthesia (1.8ml 2% Lignocaine with 1:10000 epinephrine), standard access cavity preparation followed by rubber dam isolation and pulp extirpation. After the confirmation of canal patency and working length radiograph, canals were prepared with the combination of hand files and proTaper engine-driven rotary nickel-titanium files (DENTSPLY Maillefer, Ballaigues, Switzerland) following manufacturer’s instructions. Seventeen percent EDTA gel was used as a lubricant. Irrigation was performed with 2.5% NaOCl after each instrument in all cases. Apical enlargement was accomplished by the finishing instruments, which range from F1-F5 depending on the initial diameter of the root canals. The working length of each canal was verified using Dentaport ZX apex locator (J. Morita, Japan). At the first visit, all teeth were prepared to working length and dried with paper points.

Canals in Group 1 was filled with ProTaper universal gutta-percha (DENTSPLY Maillefer) and zinc-oxide eugenol based sealer using lateral compaction technique and restored with temporary restorative material, Cavit (3M ESPE Dental, Seefeld, Germany) in the same visit. In Group 2 the canal preparation was followed by placement of non-setting calcium hydroxide paste. A sterile dry cotton pellet was placed in the canal and teeth were 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 were followed in the second visit. After obturation, the patients in both the groups were given VDS (verbal Descriptor Scale) forms to fill. Patients were instructed to mark on the horizontal scale to represent the intensity of pain. The verbal descriptors were used as a guide who are:

No pain: tooth feels normal;
Slight pain: no need to take analgesics;
Moderate pain: tolerable or is rendered tolerable by analgesics;
Strong pain: disturb normal sleep and need narcotic analgesics;
Severe pain: disturb normal activity or sleep and analgesics have no effect;
Maximum pain: unable to sleep and other general syndrome occur.

Although no systemic medications were prescribed, the patients were instructed to take 400mg ibuprofen only if they experience pain. The patients were asked to record maximum pain level before they take analgesics. Patients were contacted on telephone after 24 hours to remind them to complete and return the form.

RESULTS

Data were entered and analyzed in SPSS version 10.0. Total 440 patients were included according to the inclusion criteria of the study. Patients were randomly divided into two equal groups.

Descriptive statistics of age (years) and pain score (Modified Verbal Descriptive Scale VDS) of patients were calculated in terms of mean and standard deviation as shown in Table 1 and Table 2 respectively.

Distribution of gender of patient was also calculated in terms of frequency and percentage of male and female patients. There were 126 (57.3%) male and 94 (42.7%) female patients who were given single visit root canal treatment of teeth with non-vital pulps whereas there were 170 (77.3%) male and 50 (22.7%) female patients who came on a two visit root canal treatment of teeth with non-vital pulps.

<table>
<thead>
<tr>
<th>Two Groups</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years) one visit RCT</td>
<td>220</td>
<td>32.90</td>
<td>10.138</td>
</tr>
<tr>
<td>two visit RCT</td>
<td>220</td>
<td>32.78</td>
<td>10.160</td>
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<table>
<thead>
<tr>
<th>Two Groups</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
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</thead>
<tbody>
<tr>
<td>Pain one visit RCT</td>
<td>220</td>
<td>1.94</td>
<td>1.198</td>
</tr>
<tr>
<td>two visit RCT</td>
<td>220</td>
<td>1.53</td>
<td>1.244</td>
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</table>

<table>
<thead>
<tr>
<th>Post obturation pain at 24 hours</th>
<th>Two Groups</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>one visit RCT</td>
<td>two visit RCT</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>41 (18.6%)</td>
<td>43(19.5%)</td>
</tr>
<tr>
<td>Slight</td>
<td>33 (15.0%)</td>
<td>35 (15.9%)</td>
</tr>
<tr>
<td>moderate</td>
<td>42 (19.1%)</td>
<td>45 (20.5%)</td>
</tr>
<tr>
<td>Strong</td>
<td>62 (28.2%)</td>
<td>54 (24.5%)</td>
</tr>
<tr>
<td>Severe</td>
<td>42 (19.1%)</td>
<td>43 (19.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>220 (100.0%)</td>
<td>220 (100.0%)</td>
</tr>
</tbody>
</table>
There were 41 (18.6%) and 43 (19.5%) patients who did not feel post obturation pain on one visit and two visit root canal treatment respectively. The rest of the patients felt some degree of pain in both single visit and two visit groups as shown in Table 3. Chi-square test was used to compare frequency of post-obturation pain after one visit and two visit root canal treatment on permanent teeth with non-vital pulps which was statistically not significant (p-value 0.942).

DISCUSSION

Numerous studies evaluating the effectiveness and post treatment pain of single- versus multiple-appointment root canal treatment have been published. These studies reported no significant differences in effectiveness (healing rates) and postoperative pain between these 2 treatment regimens. However, most of the previous systematic reviews focused primarily on comparing procedures without considering the pretreatment pulpal status. Many studies have demonstrated the association of pulpal and periapical status with the outcome of endodontic treatment. In their meta-analysis, Sathorn et al evaluated the differences in healing rates between single- and multiple-visit root canal treatment for teeth with apical periodontitis and their result shows 6.3% higher healing rate in single visit root canal treatment. In case of nonvital pulp, the root canals are usually infected, especially in the presence of apical periodontitis. Effective control of intracanal microbial load before obturation is a key element that leads to a high success rate of root canal treatment. In vital pulps, aseptic conditions are maintained after instrumentation, and the primary focus of the endodontic procedure is to prevent iatrogenic infection of the root canal. Consequently, disinfection of root canals in these cases might not be needed for root canal in comparison to cases with infected pulps.

Ince et al in their study also found that prevalence of post-operative pain did not differ between vital and non-vital teeth. Yingying Su et al found patients with single-visit root canal treatment experienced short-term (immediate to 72 hours) postoperative pain less frequently i.e. 26% than those with multiple-visit root canal treatment i.e. 37%.

CONCLUSION

The study concludes that there is no difference in frequency and severity of post-obturation pain by one visit versus two visit root canal treatment of teeth with non-vital pulps.

REFERENCES


CONTRIBUTIONS BY AUTHORS

1 Sharaz Ahmed: Main author designed the work, collection of data, statistical analysis and interpretation of the data, wrote the article.
2 Alia Ahmed: Statistical analysis, final approval of the version.
3 Maria Sikander: Reviewed the article and helped in data collection.