ASSESSMENT OF THE INTERAPPOINTMENT PAIN BY USING TWO DIFFERENT INTRACANAL MEDICAMENTS

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ABSTRACT

The objective of this study was to assess the interappointment pain by using two different intracanal medicaments. Comparative study in the department of operative dentistry, Liaquat Medical University Hospital Hyderabad was carried out. 60 teeth either anterior or posterior of male and female patients of 14 to 60 years age diagnosed for root canal treatment were included. Following the routine access cavity preparation, canals were located with endodontic explorer. Working length was taken with 15# k-file, and then instrumentation was performed with proTaper hand files and shaping by the crown down technique along with irrigation by using Milton’s (1%Naocl) solution. Canals were dried with paper points and Ledermix paste in Group I and Calcium hydroxide in Group II patients were inserted in random sequence. The patients were recalled, to record the degree of pain on the next day, third day and one week and for clinical evaluation and obturation if the tooth was asymptomatic. Out of 60 cases, 33(55%) were male and 27(45%) were female. Post operative next day, mild pain was observed in 25% (15/60) patients and moderate pain in 20% (12/60) while severe pain in 13.3% (8/60) patients. Similarly on third day, mild pain was observed in 3.3% (2/60) only. While after one week mild pain was found in only 1.6% (1/60) case. Severity of pain was significantly low in group I than group II (p=0.999) after one week. Treatment with Ledermix was significantly better than with Calcium hydroxide in controlling severity of interappointment pain.

Key Words: Visual Analogue Scale, access cavity, intracanal dressing.

INTRODUCTION

Pain is the most common reason for physician consultation. It is a main symptom in many medical and dental conditions and can significantly impede with a person’s quality of life and general functioning.1 The toothache is the most common form of oral pain. For many patients, fear of dental pain and avoidance of dentist are identical. Endodontic post-treatment pain continues to be a significant problem facing the dental profession. It has been reported that up to 80% of this population will continue to report pain after endodontic treatment, with pain levels ranging from mild to severe.2

Endodontic pain that may last from several hours to several days is linked to inflammatory reactions. This pain is dependent on the damage sustained by tissues and the nature of the damaging agent. These agents may be of a bacterial, chemical, or mechanical nature. Endodontic pain may occur before, during, or after endodontic treatment. Patients with moderate to severe pain before treatment were five times more likely to experience moderate to severe pain post treatment.3
Endodontic treatment can be followed by short or long-term complications. Some of the problems of root canal treatment are post-obturation pain, interappointment pain and swelling. Pain and swelling is often sign of an offending tooth. Endodontic treatment aims to reverse the disease process and therefore eliminate the associated signs and symptoms.4

Information on the causes and the mechanisms behind interappointment pain in endodontics is important for the clinician to correctly prevent or manage this undesirable condition. The causative factors of interappointment pain cover mechanical, chemical, and/or microbial injury to the periradicular tissues, which are induced or aggravated during root canal treatment. When an interappointment emergency occurs, appropriate diagnosis and active treatment are required for the clinician to succeed in solving the problem. Certain factors have been recommended to significantly influence the development of interappointment pain including age, gender, tooth type, pulpal status, presence of preoperative pain, allergies, and presence of sinus tract.5

In root canal disinfection, complete chemomechanical preparation may be considered an essential step. Though, total elimination of bacteria is difficult to achieve, intracanal medicaments may assist to eliminate surviving bacteria.6 Intracanal medication has been widely used in efforts to kill any bacteria remaining after instrumentation and irrigation. Several different medicaments have been used over the years. Common were calcium hydroxide, eugenol, iodine potassium iodide, glutaraldehyde, formocresol, camphorated parachlorophenol, metacresylacetate, beechwood creosote, and a range of antibiotic combinations.7

Intracanal medicaments may prevent the penetration of bacteria from saliva in the root canal basically in two ways. First, medicaments possessing antibacterial properties may act as a chemical barrier against leakage by killing bacteria, thus preventing their ingress into the root canal. Secondly, medicaments that fill the entire length of the root canal act as a physical barrier against bacterial penetration.8

Calcium hydroxide if left in the canal for four weeks, it will be more effective medicament than either CMCP or camphorated phenol reported by Byström et al.8 Calcium hydroxide was able to render 97% of their canals culture-negative, while other medicaments achieved this in only two-thirds of the treated canals8.

Ledermix is a corticosteroid antibiotic paste or cement. Ledermix paste is an ideal medicament to be used as an initial dressing predominantly if the patient presents with endodontic symptoms. Though the antibacterial spectrum of Ledermix paste, against the most commonly found endodontic bacteria has been reported.9

The results of this study may therefore be helpful for the practitioners in performing the Root Canal Treatment with a better approach, so patients experience a smaller amount of pain during interappointment visits.

**METHODOLOGY**

Comparative study was carried out at the department of Operative Dentistry, Liaquat Medical University Hospital Hyderabad from 1st May to 30th November 2010. Sixty patients were treated, which were divided into two groups; in Group one: 30 were treated with ledermix paste and in Group two: 30 were treated with calcium hydroxide. Randomized sampling technique was used. All anterior and posterior teeth with periapical periodontitis, with or without periapical radiolucency and with pulp necrosis of either gender of 14 to 60 year of age were included in the study. Teeth with incomplete root formation and teeth with severe periodontal problem and patients suffering from systemic problems e.g. diabetes and autoimmune disease etc were excluded from the study.

Patients were selected by odd numbers and randomly divided into two groups and informed consent for the procedure was obtained. Complete demographical data were recorded on proforma. Before start of treatment, preoperative pain was recorded on proforma by using Visual Analogue Scale (VAS). Following the routine access cavity preparation and location of canals were attempted by exploring method with endodontic explorer. Working length was taken with No.15 K-files and then instrumentation was performed with pro Taper hand files and shaping by the crown down method along with irrigation using
Milton’s (1%Naocl) solution. Canals were dried with paper points and one of the two medicaments was inserted into canal in random sequence. Group One: Ledermix paste (lederle pharmaceuticals) and Group two: Calcium hydroxide (calcipulp, septodent France).

The patients were recalled to record the degree of pain next day, third day and after one week of the intracanal dressing and were called for clinical evaluation and obturation if symptom less. Data were analyzed in statistical software SPSS-16. Frequency and percentage were computed of categorical variables like gender, and severity of pain while mean and standard deviation were estimated for quantitative variables like age. Chi-square test was applied to compare proportion difference between groups in severity of pain with respect to follow-up. Independent sample t test was applied to compare mean age between groups. P<0.05 was considered significant.

RESULTS

Sixty patients with periapical peridontitis were included in this study. Patients were equally divided into two groups. Thirty patients were in group I, they were treated with Ledermix paste and group II were treated with calcium hydroxide.

Age distribution of the patients is presented in figure 1. The average age of the patients were 25.43±7.38 years (95%CI: 23.52 to 27.34). Significant difference was not observed between groups for age (p=0.134) as shown in figure 2. Out of 60 cases, 33(55%) were male and 27(45%) were female. Gender distribution with respect to group is presented in figure 3.

Table 1 showed pain difference within groups. In group I, difference in pain was not significant in postoperative next day and at 3rd day and that was also

<table>
<thead>
<tr>
<th>Group</th>
<th>Evaluation Day</th>
<th>No Pain</th>
<th>Mild Pain</th>
<th>Moderate Pain</th>
<th>Severe Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ladermix (Group-1)</td>
<td>Next Day</td>
<td>15 (50%)</td>
<td>7 (23.3%)</td>
<td>5 (16.6%)</td>
<td>3 (10%)</td>
</tr>
<tr>
<td></td>
<td>After 03 Day</td>
<td>14 (46.6%)</td>
<td>1 (3.3%)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>After 01 Week</td>
<td>13 (43.3%)</td>
<td>1 (3.3%)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Calcium Hydroxide</td>
<td>Next Day</td>
<td>10 (33.3%)</td>
<td>8 (26.6%)</td>
<td>7 (23.3%)</td>
<td>5 (16.6%)</td>
</tr>
<tr>
<td>(Group-2)</td>
<td>After 03 Day</td>
<td>9 (30%)</td>
<td>1 (3.3%)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>After 01 Week</td>
<td>8 (26.6%)</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

Fig. 1: Age Distribution with respect to Groups

Fig. 2: Comparison of Age between Groups
Assessment of interappointment pain

not significant difference 3rd day and after one week while in group II difference of pain was also not significant among follow-up.

Post operative next day, mild pain was 25% (15/60) patients and moderate pain was observed in 20% (12/60) while severe pain was noted in 13.3% (8/60) patients. Comparison of inter appointment pain between groups after postoperative at next day were assessed but significant difference was not observed (0.59) as presented in figure 4. Similarly at third day, mild pain was observed in 3.3% (2/60) but significant difference was also not observed between groups (0.999) as shown in figure 5. While after one week mild pain was found in only 1.6% (1/60) case. Severity of pain was significantly low in group I than in group II (0.999) after one week as presented in figure 6.

DISCUSSION

The purpose of intracanal medicaments is an adjuvant therapy to resolve the infection. Ledermix (triamcinolone and dimethylchlorotetracycline in a water soluble cream) is used for pulp capping, exposures, and as an intracanal medicament in cases with pericementitis reported by Ehrmann. He concluded that ledermix stopped the pain associated with pericementitis. Langeland et al used ledermix as an intracanal medicament in cases of continued postoperative pain after pulpal extirpation or canal instrumentation. They reported pain relief in these cases within minutes to a few hours after the placement of ledermix. Numerous past studies show diminution or absence of interappointment pain when ledermix was used after debridement.
Ehrmann et al\textsuperscript{10} explore the relationship of postoperative pain associated with three different treatment regimes for infected teeth with acute apical periodontitis after complete biomechanical debridement of the root canal system in patients presenting for emergency relief of pain. They informed that the patients with teeth dressed with ledermix paste had less pain than that experienced by patients who had teeth dressed with calcium hydroxide or no dressing at all.

Calcium hydroxide has a great value in endodontics and is used for several clinical conditions. It has a limited antibacterial spectrum that does not affect all members of the endodontic microbiota. Additionally, physicochemical properties of this substance may limit its effectiveness in disinfecting the entire root canal system after a short-term use.\textsuperscript{12} However, the antibacterial activity of calcium hydroxide is still controversial and it is not clear whether the benefits of this substance are based solely upon superior antibacterial activity.\textsuperscript{13}

There are two possible reasons for the failed inhibition of bacteria with calcium hydroxide. One rapid absorption of calcium hydroxide leading to a pH fall to neutral levels and Two, bacteria that are pocketed from the action of the chemical by high caliber of their survival and/ or growth within dentinal tubules or their ramification and microleakage of temporary filling materials between appointments.\textsuperscript{14}

The choice of which intracanal medicament to use during endodontic treatment is dependent on having an accurate diagnosis of the condition being treated. If the primary aim is to control inflammation, then a corticosteroid-antibiotic mixture is indicated. The current study indicates that calcium hydroxide may not be the most ideal medicament for all cases with infected root canal systems with or without apical periodontitis and in previously root filled teeth.\textsuperscript{15}

The relationship of intracanal medicaments to so-called endodontic flare-ups: Formocresol, ledermix and calcium hydroxide were placed in strict sequence irrespective of the presence or absence of symptoms and radiographic signs of apical periodontitis. Trope evaluated and he found no significant difference in the flare-up rate amongst these three intracanal medicaments.\textsuperscript{16}

Mechanical, chemical or microbial insult during root canal preparation and may clarify its effect on prevalence of post preparation pain. Other factors such as age, gender, history of allergies, presence of sinus tract, size of lesion and history of root canal treatment were found to have no significant influence on post preparation pain.\textsuperscript{7}

Various authors have reported the incidence of post treatment endodontic pain. The information of incidence of pain was disconcertingly different among clinical investigators. O’Keefe\textsuperscript{17} found that 16% of patients had moderate to severe post treatment pain. Clem\textsuperscript{18} found that 25% incidence of post treatment pain after endodontic treatment of 318 teeth. Seltzer et al\textsuperscript{19} reported a 40% incidence of post treatment pain in a study of 698 patients. In this study, the incidence of post treatment pain was 48.5%. The variability of human pain response could, in part, be a result of social, cultural, and psychological factors.

The most prominent observation in the present study was the frequency with which the interappointment pain associated with endodontic therapy disappeared. The corticosteroid-antibiotic cream was placed in the root canal, and pain subsided within an hour in the majority of patients, supporting the results of Schneider\textsuperscript{20} who reported that when the steroid antibiotic cream was placed in the canal, pain subsided before the patient left the office. No incidence of postoperative infection or swelling was recorded with the use of the corticosteroid antibiotic medication. There was no pain or sensitivity after the treatment, and no side effects were recorded after the use of the drug. The possibility of systemic side effects is remote as the constituents absorbed from the site over a relatively short duration are minute.

These findings are highly hopeful and equivalent with the findings reported in previous studies of such kind\textsuperscript{10}. The decrease in pain level after the use of placebo could be a function of pain resolution with healing. The results of the present study strongly support the potential value of the intracanal use of corticosteroid antibiotic combination for the relief of post endodontic pain.

**CONCLUSION**

Though, the results of present study showed that the Ledermix treatment was significantly better than calcium hydroxide in controlling severity of interappointment pain. The intracanal use of corticos-
teroid antibiotic compound was effective in rapidly controlling post treatment pain with no reoccurrences and no side effects. These findings are highly encouraging and agree with the results reported in various previous studies. The outcome of the current study strongly holds up the potential value of the intracanal use of corticosteroid-antibiotic combination for the relief of interappointment pain.

REFERENCES