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Original Research

Prevalence of Pain after Receiving Root Canal Treatment: A Cross-Sectional Study

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ABSTRACT

Aim
To evaluate the incidence, severity, and types of postoperative pain presenting after root canal treatment in teeth with vital or necrotic pulp and after retreatment.

Methods
This cross-sectional study was conducted on personnel having a history of root canal treatment with vital pulp, necrotic pulp, or vital pulp that had been treated for symptomatic irreversible pulpitis, or who have received retreatment of the root canal. A structured questionnaire accessed age, gender, history of root canal treatment, post-operative pain and, other related information. Data was analyzed using SPSS.

Results
Of the total of 182 participants ranging from 18-60 years age, 37% were males and 63% females. Post treatment pain was exhibited by all age groups in a similar number. Both male and female participants experienced inflammation and abscess after root canal treatment in equal proportions.

Conclusion
Prevalence of pain is high among the patients with history of root canal treatment. Significant differences among age groups were observed regarding pain related factors other than the type of pain.

INTRODUCTION

Pain is an unpleasant emotional and sensory expe¬rience correlating with actual or potential tissue damage. 1 The goal of root canal treatment is to seal the entire root canal system by an adequate biomechanical preparation, with no discomfort to patient and provide condition for peri-radicular healing.2 Furthermore, the main objective of endodontic therapy is to shape, clean, disinfect, and obturate canals without any injury to the peri-radicular tissues. Since the majority of endodontic problems are microbial in origin, their removal is considered the most important step in root canal therapy.3-5

Some patients come with pain or flare up after treatment. This post-operative pain is an undesirable situation for both the dentist and patient. The most common reason of postoperative pain includes mechanical or chemical injury to pulp or peri-apical tissues. There is a clear indication of interactions between peri-apical tissues and microorganisms because flare-ups are more likely to occur in necrotic cases than in vital cases. This indicates a clear relationship between pulp status and postoperative pain even after successful endodontic therapy. 6-7

There are other factors which contribute in pain after root canal. One of these factors is the complications during root canal irrigation. Several materials have been used to serve this purpose, which includes sodium hypochlorite and hydrogen peroxide.8 Number of visits for root canal treatment usually plays an important role in determining the incidence of post operative pain among patients. Literature review focusing on the healing capacity of tooth after single visit root canal

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revealed that pain is a common complication in such treatment modalities.9

Use of intra-canal medicaments can improve the chances of patients not having any pain after root canal treatment. They eliminate bacteria, reduce inflammation, and help to dry wet canals.10 Previous studies have indicated varying levels of pain among the patients undergone root canal treatment. Overall, in majority of the patients, there has been a decline in pain after root canal treatment as compared with the pain before the treatment.11 A study conducted among the root canal patients determined the prevalence of pain in single vs. two visit root canal treatment revealed that there was no significant difference between these two groups of patients.12

A meta-analysis showed that an average of 5% of patients experienced more pain after root canal treatment.13 Another study was conducted to assess the post operative pain among patients undergone root canal therapy for vital and non-vital teeth. Results suggested no significance difference among the patients belonging to these groups.14 The purpose of this study was to evaluate the incidence, severity, and types of postoperative pain presenting after root canal treatment in teeth with vital or necrotic pulp and after retreatment.

METHODS

This is a cross sectional study utilizing personnel having a history of root canal treatment with vital pulp, necrotic pulp, or vital pulp that had been treated for symptomatic irreversible pulpitis, or who have received retreatment of the root canal. A structured questionnaire accessed age, gender, history of root canal treatment, post-operative pain and, other related information. This study was conducted after acquiring approval from the institutional review board of Riyadh Elm University (REU). A random sample of 182 patients were included with the following inclusion and exclusion criteria:

INCLUSION CRITERIA

One hundred eighty two patients, aged between 18-60 years from both genders. The criteria included all patients in REU and private clinic in Riyadh undergone treatment of only one tooth and having received treatment at least 3 months before the collection of data.

Indications for treatment were:

(1) Teeth with vital healthy pulp that were treated for prosthetic reasons.

(2) Teeth with previously initiated therapy consequent to symptomatic irreversible pulpitis.

(3) Teeth with necrotic pulp.

(4) Teeth that were designated for endodontic retreatment due to apical periodontitis.

EXCLUSION CRITERIA

Patients with symptomatic irreversible pulpitis, preoperative pain, and necrotic pulp associated with clinical symptoms such as swelling or purulence.

STATISTICAL ANALYSIS

Descriptive statistics was performed to present the overview of findings. Cross-tabulation and Chi-square tests was used to determine the association between the study groups. Data were analyzed using SPSS Version 21. A p value of $\leqslant 0.05$ was considered as statistically significant.

RESULTS

Study participants included age groups ranging from 18-60. Figure 1 shows that 40% of the participants belonged

to age group 18-30, 32% from 31-40, 21% from 41-50 and 7% from 51-60. This study included 37% males and 63% females (Figure 2). Table 1 shows that 40% of the participants in age group 18-30 had a history of root canal, 73% of the participants from age group 31-40 had experienced pain or swelling before root canal treatment, 54% of the study participants from age group 41-50 had taken antibiotics during the treatment, all patients from age group 51-60 reported that they had undergone complete root canal treatment, 22% of patients from age group 18-30 revealed that they experienced pain even after 3 months of root canal treatment. Merely 15% of the study participants from age group 31-40 had undergone re-treatment for root canal, 85% of age group 18-30 did not experience any inflammation or abscess after root canal treatment.

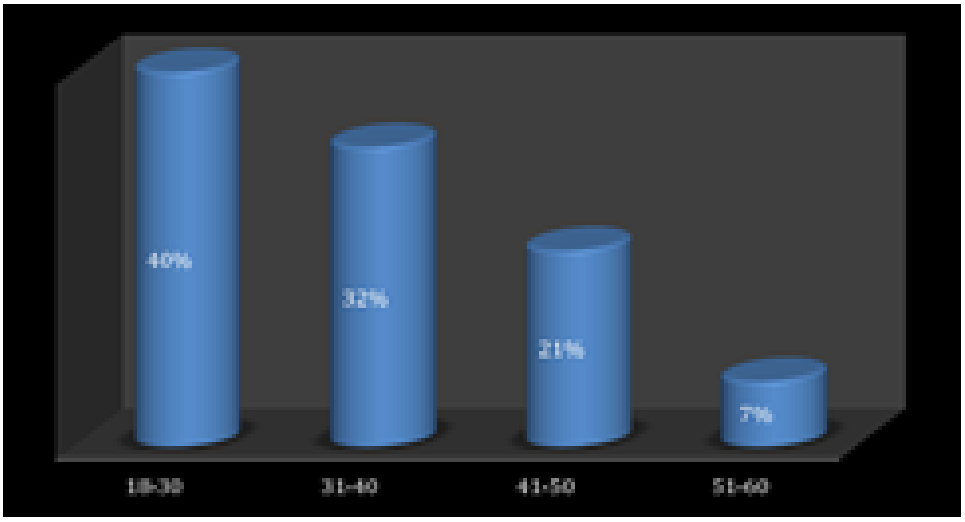

Figure 1: Distribution of participants by age groups

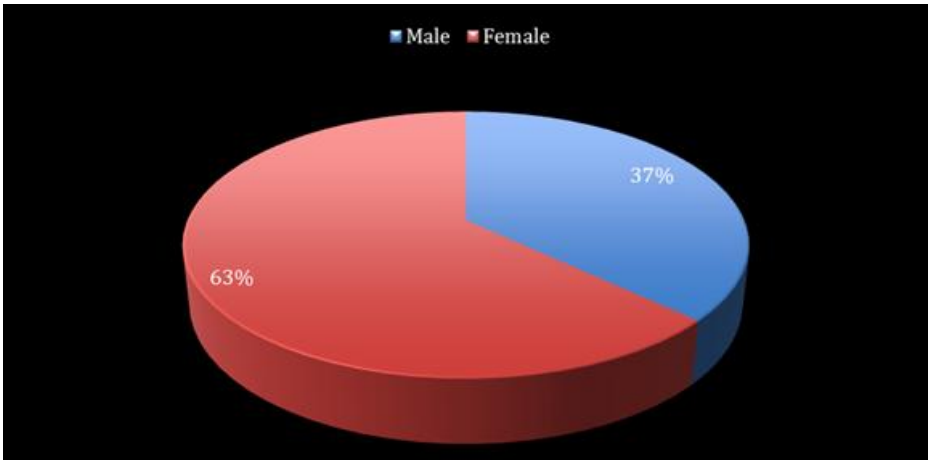

Figure 2: Distribution of participants by gender

Post treatment pain was exhibited by all age groups in a similar number. The majority (76%) of females had experienced pain or swelling before root canal treatment, 68% of the male participants had used antibiotics during the course of treatment, 96% of female patients had completed their root canal treatment, 30% of the male participants experienced pain for more than 3 months after RCT, 15% of the females had undergone re-treatment for root canal. Both male and female patients experienced inflammation and abscess after root canal treatment with the percentage being equal (15%) (Table 2).

Table 1: Association of the items with age groups

Item	18-30 years	31-40 years	41-50 years	51-60 years	p value
History of root canal treatment	Yes: 40% No: 60%	Yes: 34% No: 64%	Yes: 20% No: 80%	Yes: 6% No: 94%	-
Pain/swelling before RCT?	Yes: 85% No: 15%	Yes: 73% No: 27%	Yes: 80% No: 20%	Yes: 50% No: 50%	0.043
Did you take antibiotics during the treatment?	Yes: 76% No: 24%	Yes: 74% No: 26%	Yes: 54% No: 46%	Yes: 50% No: 50%	0.032
Did you complete the whole RCT?	Yes: 97% No: 3%	Yes: 94% No: 6%	Yes: 95% No: 5%	Yes: 100% No: 0%	0.783
Was there any pain after RCT lasting more than 3 months?	Yes: 22% No: 78%	Yes: 36% No: 64%	Yes: 51% No: 49%	Yes: 50% No: 50%	0.012
Have you ever ‘re-do' the RCT?	Yes: 5% No: 95%	Yes: 15% No: 85%	Yes: 15% No: 85%	Yes: 0% No: 100%	0.233
Cause was inflammation or abscess?	Yes: 15% No: 85%	Yes: 14% No: 86%	Yes: 17% No: 83%	Yes: 0% No: 100%	0.586
What was the degree of pain?	No pain:75% 2: 7% 3: 3% 4: 8% 5: 7%	No pain:61% 2: 7% 3: 10% 4: 10% 5: 12%	No pain:54% 2: 10% 3: 20% 4: 10% 5: 6%	Nopain:50% 2: 0% 3: 33% 4: 10% 5: 7%	0.061
Type of pain?	No pain:79% Eating:14% Sleeping:7%	No pain:61% Eating:24% Sleeping:15%	No pain:46% Eating:38% Sleeping:16%	No pain:40% Eating:40% Sleeping:20%	0.013
Pain site?	Upper jaw:8% Lower jaw:29%	Upper jaw:31% Lower jaw:20%	Upper jaw:27% Lower jaw:40%	Upper jaw:44% Lower jaw:22%	0.023

Table 2: Association of the items with gender

Item	Male	Female	p value
History of root canal treatment	Yes: 39% No: 61%	Yes: 61% No: 39%	-
Pain/swelling before RCT?	Yes: 76% No: 24%	Yes: 78% No: 22%	0.854
Did you take antibiotics during the treatment?	Yes: 68% No: 32%	Yes: 70% No: 30%	0.868
Did you complete the whole RCT?	Yes: 97% No: 3%	Yes: 96% No: 4%	0.996
Was there any pain after RCT lasting more than 3 months?	Yes: 30% No: 70%	Yes: 37% No: 63%	0.335
Have you ever're-do' the RCT?	Yes: 11% No: 89%	Yes: 15% No: 85%	0.621
Cause was inflammation or abscess?	Yes: 15% No: 90%	Yes: 15% No: 90%	1.000
What was the degree of pain?	No pain:70% 2: 0% 3: 12% 4: 12% 5: 6%	No pain:61% 2: 11% 3: 10% 4: 8% 5: 8%	0.059
Type of pain?	No pain:69% Eating:22% Sleeping:9%	No pain:61% Eating:25% Sleeping:14%	0.496
Pain site?	Upper jaw:20% Lower jaw:20%	Upper jaw:24% Lower jaw:32%	0.210

DISCUSSION

Pain followed by root canal treatment is not an unfamiliar situation for the dentists. General practitioners come across this dilemma quite often in their clinical practice. This study aimed to determine the prevalence and extent of pain among the patients gone through root canal treatment before at least 3 months or so. We recruited patients from the outpatient department of REU as well as few private clinics in Riyadh. We divided the study participants into two groups. One group focused on gender whereas the other was related to different age groups. The rationale behind this grouping was to develop an association and look for significant relationships.

It can be noted from the results that majority of the association made among age groups were statistically significant as compared to gender, which did not exhibit significant differences in majority of survey questions.

As far as the significant comparisons were concerned, older age group showed increased pain after 3 months of RCT, highest prevalence of pain during eating was also found in this group. They reported to have consumed the least number of antibiotics as compared to all other age groups.

We compared our results with previously done studies and found some interesting comparisons. A meta-analysis done by Nixdorf et al. (2010) revealed that 5% of patients experienced more pain after root canal treatment.13 Whereas, our study shows that this percentage to be 34%. This difference is significant, but our sample size was small as compared to the total sample being studied in the meta-analysis. Another important comparison was made with a systemic review conducted by Mathew (2015), which disclosed the importance of discussing variables including gender, type of teeth, relation with post-obturation pain, number of visits, medications, instrumentation and obturation techniques.15 However, our study focused only on gender, age group, and medications.

CONCLUSION

Prevalence of pain is high among the patients with history of root canal treatment. No significant difference between males and females regarding pain related factors. Significant differences among age groups were observed regarding pain related factors other than the type of pain.

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