FREQUENCY DETERMINATION OF AETIOLOGICAL FACTORS IN TEETH TREATED ENDODONTICALLY

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ABSTRACT

Background: Root canal treatment is an important treatment modality to restore the damaged or carious teeth so that the natural dentition can be preserved. Various indications of root canal treatment have been identified which have seriously insulted to the pulpal tissue and need early and effective treatment. Therefore it is very important to educate the patients and their relatives to prevent these factors.

Objective: The main objective of this study was to to ascertain the frequency of different aetiological factors for the root canal treatment in 200 patients

Design: Descriptive study.

Place and duration of study: At Operative Dentistry Department of Armed Forces Institute of Dentistry from January 2010 to July 2010.

Methods: Total of 200 fulfilling the inclusion criteria reporting in OPD of Operative Dentistry Department of AFID Rawalpindi were included in the study.

Results: A total of 200, 70 (35%) were females and 130 (65%) were males. The frequency of exposed teeth requiring root canal therapy in descending order were mandibular 1st Molar (19.5%), maxillary first molar (17.5%),maxillary second molar (13.5%), mandibular second molar (12.5%), mandibular second pre molar (9%), maxillary central incisors (8%), maxillary second premolar (6%), maxillary canine (4%), mandibular canine (3%), maxillary first premolar and lateral incisors (2.5%) each, and mandibular first premolar and lateral incisors (1%) each.

Common indications for root canal therapy were necrotic pulp 47.5% involving 95 teeth, irreversible pulpitis 42.5% involving 85 teeth, trauma 6.5% involving 13 teeth, short obturation 2.5% involving 5 teeth and chronic hyperplastic pulpitis 1% involving 2 teeth.

Conclusion: Necrotic pulp was the most common indication of initial RCT followed by irreversible pulpitis., while short obturation was the common indication of failed RCT.

Keywords: Irreversible pulpitis, Necrotic pulp, Root canal treatment, Short obturation.

INTRODUCTION

Toothache has affected mankind since time immemorial. The Chinese as well as Egyptians have left records describing caries and dental abcesses. The Greeks and Romans had tried cauterizing the pulpal tissue using hot needles or boiling water. Providing drainage, by drilling into the pulp chamber causing relief in pain was known around the end of 1st century AD[1].

It was only in mid 1930's the modern concept of root canal treatment started taking shape. There was an overall improvement in radiographs, anaesthetics and procedures[2]. The concept of disinfection at apical seal were developed after well documented cases were analyzed over the year. It was as late as the 1970 when better quality material was introduced and with the advanced knowledge of tooth biology that present day success story of root canal treatment emerged to be sounded[3]. This includes treatment of damaged or necrotic pulp so as to allow the tooth to remain functional in the dental arch[4].

While analyzing the common indications of root canal treatment, irreversible pulpitis and necrotic pulp are the commonest[5]. Teeth that are characterized as having irreversible pulpitis exhibit intermittent or spontaneous pain, whereby rapid exposure to dramatic temperature changes (especially to cold stimuli) will elicit heightened and prolonged episodes of pain even after the source of the pain is removed. The pain may be sharp or dull,

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localized or referred. Typically there are minimal changes in the radiographic appearance of the periradicular bone[6]. With advanced irreversible pulpitis a thickening of the periodontal ligament may be evident, and there may be some suggestion of pulpal irritation by virtue of extensive canal calcification[7].

When pulpal necrosis occurs, the pulpal blood supply is nonexistent and the pulpal nerves are non responsive. It is the only clinical classification that directly attempts to describe the histologic status of the pulp. This condition is subsequent to symptomatic or asymptomatic irreversible pulpitis. In complete pulpal necrosis and before any pathosis extends into the periodontium, the tooth is typically asymptomatic. It will not respond to electric pulp tests or to cold stimulation[8]. However, if heat is applied for too long, the tooth may respond, possibly relating to remnants of pulpal fluid or gases expanding and extending into the peri-apical region. A traumatic injury to a tooth may prevent the lack of a response to pulp tests and mimic that of pulpal necrosis; therefore a good dental history is imperative. Pulpal necrosis may be partial or complete and it may not involve all of the canals in a multi-rooted tooth. For this reason, the tooth may present with confusing symptoms, whereby pulp testing over one root may give no response while over another root may give a vital response, and the tooth may exhibit symptoms of an irreversible pulpitis[9].

A traumatic injury to the tooth results in damage to many dental and periradicular structures. Pulpal exposure in primary and immature permanent teeth can lead to a proliferative response, or hyperplastic pulpitis[10]. Exuberant inflammatory tissue proliferates and herniates through the exposure forming a 'pulp polyp'[4].

Under extension of root canal filling material may be caused by failure to fit the master gutta-percha point accurately. it can also result from a poorly prepared canal ,particularly in apical part of canal, which may need revised treatment[11].

The purpose of this study is to ascertain the frequency of indications of root canal treatment as it is very important endodontically for the dental practitioners to be well conversant with all these and they can update and treat the patients as RCT is one of the common and very important dental procedures[12,13]. Timely diagnosis and effective treatment can prevent the spread of the disease (particularly in challenging pulpal involvement) into peri-radicular tissue which can trigger different complications .

PATIENTS AND METHODS

This descriptive study was carried out from January 2010 to July 2010, a total of 200 patients fulfilling the inclusion criteria reporting in OPD of Operative Department of AFID Rawalpindi were included in the study.

Inclusion Criteria:

- Patients having complete permanent dentition (13 years and above)
- Teeth with complete root formation.
- Patients with satisfactory oral hygiene.

Exclusion Criteria.

- Physically and mentally handicapped patients.
- Teeth with vertical root fractures.
- Worse fractured teeth / mutilated teeth/ unrestorable teeth.
- Teeth with resorption defects
- 3rd Molars

Materials and Methods

All the patients fulfilling the inclusion criteria, who reported in the OPD were investigated . All necessary information like patient age, gender, address and any other significant medical information were recorded on a predesigned proforma by the author, followed by detailed dental history, intra-oral examination and radiographs. In borderline cases consultation of the supervisor/advisor was sought. All the data collected through the performa (the criteria for indication of RCT therapy was derived from Saad and Clem[18] as

shown in table 1). Data had been analyzed using SPSS 15.

Descriptive statistics were used to describe the data i.e mean and standard deviation for quantitative variables and frequency along with percentages for qualitative variables.

RESULTS

Out of two hundred patients 70(35%) were female and 130(65%) were male .

The mean age of the patients was 34.05±10.26 years. Minimum age was 13 years and maximum age was 56 years in the patients under study.

The frequency of exposed teeth requiring root canal therapy in descending order were mandibular 1st molar (19.5%) followed by maxillary first molar (17.5%), maxillary second molar (13.5%), mandibular second molar (12.5%), mandibular second pre molar (9%), maxillary central incisors (8%), maxillary second premolar (6%), maxillary canine (4%), mandibular canine (3%), maxillary first premolar and lateral incisors (2.5%) each, and mandibular first premolar and lateral incisors (1%) each (figure 1 & 2).

Common indications for root canal therapy were necrotic pulp involving 95(47.5%) teeth , irreversible pulpitis involving 85 (42.5%) teeth, trauma involving 13(6.5%) teeth, short obturation involving 5(2.5%) teeth and chronic hyperplastic pulpitis involving 2(1%) (Fig. 3).

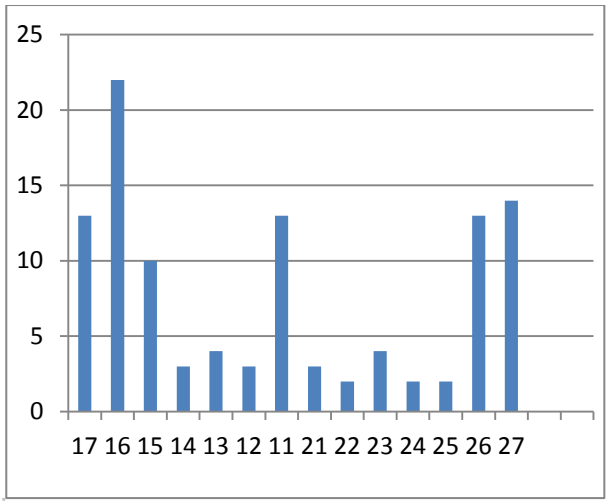
Table 1: The criteria for indication of root canal therapy.[17]

Necrotic pulp	No response to cold and electric test
Irreversible pulpitis	Lingering pain and sensitivity after removal of stimulus
Intentional RCT	For restorative purposes
Re-treatment	Failed RCT (requiring re-treatment)
Trauma	History of physical injury
Others	Reasons other than above

Table-2. Gender distribution of patients(n=200)

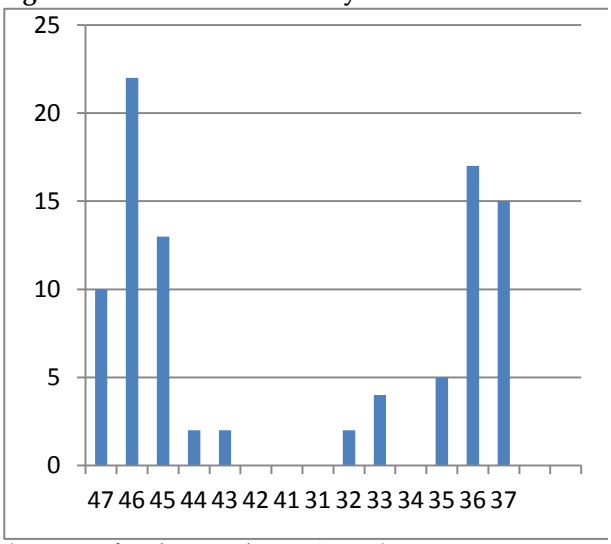
	Frequency	Percentage
Female	70	35
Male	130	65

DISCUSSION



(Location of teeth as per the FDI System)

Fig. 1: Disribution of maxillary teeth



(Location of teeth as per the FDI System)

Fig. 2: Distribution of mandibular teeth.

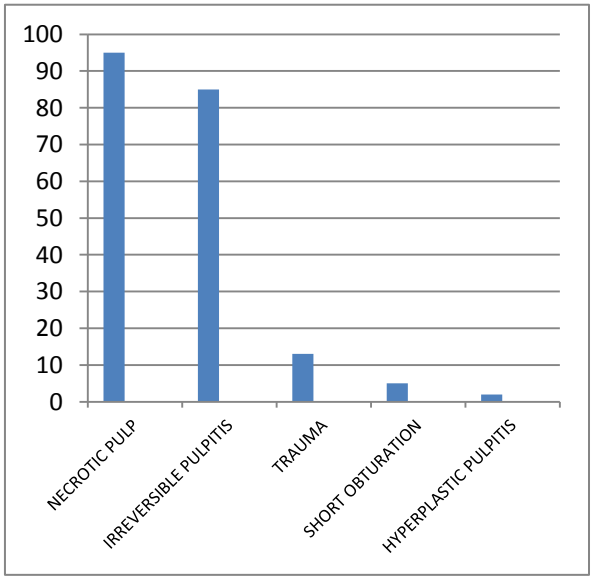


Fig. 3: Various indications of root canal treatment

As a result of this study a very useful information about the various causes of RCT have been identified which will help in providing better dental treatment to the population of Pakistan in future.14

We found that necrotic pulp and irreversible pulpitis were the most common reasons for performing RCT which is consistent with the results of various previous studies done in our country. We can also infer that these are the sequele of dental caries which is a major threat and should be effectively addressed both from preventive and therapeutic aspects[14,15].

In contrast to previous studies , trauma was not the main indication of RCT(as shown in figure 3). Trauma was most commonly seen in young individuals. Our results were compatible to that reported by Yohra et al.[17], but necrotic pulp was the most common reason in our study while irreversible pulpitis was the major cause in the quoted studies[16]. Failed RCT due to short obturation was only seen in 2.5 % which was less as compared to previous studies[17].

CONCLUSION

It is evident from our study results that necrotic pulp, irreversible pulpitis and trauma are the most common reasons of RCT in our community , accompanied by failed RCT due to short obturation, which are very alarming and pose significant dental health challenges both for our doctors and people. Therefore it is the need of the day that effective preventive strategies be formulated in the form of patient dental health education and early treatment of carious lesions of teeth so that need for RCT can be reduced.

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