

Frequency of root canal treatment among patients attending dental college in Bhopal

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Abstract

Aim: The purpose of the study was to evaluate the frequency of RCT in OPD, to evaluate particular teeth, estimate mean frequency of male /female patients who visited to dental college.

Material and methods: A total of 600 patients visited the clinics during the study period. Through the use of radiographs, frequency of RCT in OPD, particular teeth and mean frequency in male and female ratio was seen. The analysis of data was performed using methods of descriptive statistics.

Result: It shows that maximum number of patients undergone RCT is 419 (69.8%) in 600 patients. The maximum number of RCT's are found in 1st molars and the mean frequency of RCT's is more in males when compared to females.

Conclusion: The first molars were the most frequently found for undergoing RCT in both maxilla and mandible followed by second molar & second premolar. Periapical lesions showed an almost similar pattern among teeth with a higher number of radiolucencies found in the 1st molar in both the arches followed by second molar.

Keywords: Endodontics, periapical disease, radiographic evaluation, root canal treatment.

INTRODUCTION

Dental caries leads to irreversible pulpitis and subsequent root canal treatment. Many countries in the world have a high prevalence of dental caries, and the same scenario has been observed in India.¹

Endodontic treatment is an essential part of quality comprehensive dental care. Improvements in instruments and materials and advances in science have made modern endodontic therapy a regimen with a reported high degree of success.²

Endodontics is the branch of dentistry that deals with diseases of the tooth root, dental pulp, and surrounding tissue in human. It is a profession based on the work with other people, so several factors should be considered during clinical decision-making process.³

Root canal treatment (RCT) is one of the most common endodontic procedures for which patient visits the dentist. Patients' awareness and knowledge of the endodontic treatment is a very important issue in everyday dental practice. It influences significantly the course and effects of treatment.⁴

Survey conducted by Sisodia et al showed a moderate level of awareness about endodontic treatment among the selected sample of dental patients. It also highlighted the need for providing more information to the patients about the advantages of retaining teeth via endodontic therapy (Sisodia N et al. 2008)⁵.

It has been demonstrated that dental anxiety and expectation of pain had a profound effect on a patient's ability to understand information provided. A person's cognitive ability to process information is significantly affected by stress (Eli I et al. 2008).⁶ Indeed, some research has suggested that dental fear is a stronger predictor of poor oral health than structural factors such as income, dental costs, and insurance status, several studies confirm that dental anxiety is more common in women (Humphries GM et al. 2009, Erten H et al. 2006, Scott DS and Hirschman R 1982).⁷ The impact of root canal treatment on the oral health-related quality of life of patients has been evaluated using the short form (OHIP-14) or modified version (OHIP-17) of the Oral Health Impact Profile (OHIP-14) (Slade GD 1997).⁸

The distinctly positive impact of root canal treatment was apparent, regardless of cultural background of the patient group or the measure used (Dugas NN et al. 2002, Gotten DL et al. 2011).⁹

As expected, physical pain, psychological discomfort (feeling tense), and disability (difficulty in relaxing) were the most improved domains following treatment. The literature shows that surveys on the frequency of endodontic treatment on various teeth are not always in agreement. Ingle and Taintor¹⁰, in a study of 1,229 teeth, found that their results were similar to those of Strindberg¹¹, but they did not correlate well with those of Sommer et al.¹²

Different scientific committees have their recommended guidelines regarding the quality of treatment, which most dentists follow. However, evidence from the studies suggests that the quality of treatment still needs to be improved.

Therefore, the aim of this study to evaluate the frequency of RCT in OPD, evaluate frequency of particular teeth and estimation of mean frequency of RCT in male /female ratio.

MATERIAL AND METHODS

This retrospective study included patients who attended the outpatient clinics of the College of Dentistry in the Madhya Pradesh in Bhopal from NOVEMBER 2019 to JANUARY 2020. The study was approved and ethical clearance was granted by the Scientific and Research Committee of the college (RKDF/DC/PG/2020/14791). The inclusion criteria were based on the availability of digital periapical radiograph. Initially, a trained General dentist reviewed the radiographs and identified those patients who had required root canal treatment. Later, a qualified examiner (endodontics) further evaluated these radiographs to determine the periapical status. This study has been conducted to evaluate the frequency of RCT in OPD, to evaluate the frequency of particular teeth and estimation of mean frequency of RCT in male /female ratio. Information was collected regarding patient's age, sex, type of tooth, reasons for endodontic treatment and number of treatment visits required to complete the root canal treatment for each tooth. Data were entered into SPSS computer system analysis. Chi square test was used because data obtained were categorical.

STATISTICAL ANALYSIS

The data were analyzed using the SPSS 19 (Windows; SPSS Inc., Chicago, IL, USA). Descriptive statistics included mean, standard deviation and range of different age and RCT frequency, while inferential statistics included chi-square test.

RESULT

TABLE – 1 Frequency distribution based on the demographic data

DEMOGRAPHIC DETAILS		FREQUENCY	%
AGE	<29	282	47
	30-39	164	27.3
	40-49	84	14
	>50	70	11.7
GENDER	FEMALE	240	40
	MALE	360	60

A total of 600 patients visited the dental college during the selected time period. Only 419 [69.8%] patients who had root canal cases teeth met the inclusion criteria and were used for further analysis. Approximately, 47% of the included cases were of the age group of 16 to 30, middle age group and more than 50 age group is less as compared to adults. From the study group, 60% were males and 40 % were females (Table 1). As per the study frequency distribution of various tooth disease & problems based on their presence and absence in an individual, we found that the maximum number of individuals showed highest carious frequency 56.2%, 55% apical radiolucency while only 35.7% had acute apical periodontitis (Table 2). The frequency of tooth involved in RCT is found with the permanent 1st molar i.e., 28.7% while the least involvement was shown in 3rd molar i.e., 3.8% (Table 3). The mean RCT distribution based on the gender distribution shows that, male shows meaner of RCT i.e., 1.09 ± 1.05 as compared to the females' i.e., 0.93 ± 0.90 .

TABLE-2 Frequency distribution of various tooth problems based on the presence and absence of it

Diagnosis	Present/absent	Frequency	%
NORMAL	PRESENT	135	22.5
	ABSENT	465	77.5
THICKENED PDL	PRESENT	210	35
	ABSENT	390	65
APICAL RADIOLUCENCY	PRESENT	330	55
	ABSENT	270	45
ROOT RESORPTION	PRESENT	4	0.7
	ABSENT	596	99.3
FURCAL	PRESENT	0	0
	ABSENT	600	100
GINGIVITIS	PRESENT	176	29.3
	ABSENT	424	70.7
CARIES	PRESENT	337	56.2
	ABSENT	263	43.8
REVERSIBLE PULPITIS	PRESENT	22	3.7
	ABSENT	578	96.3
IRREVERSIBLE PULPITIS	PRESENT	135	22.5
	ABSENT	465	77.5
NECROTIC PULP	PRESENT	12	2
	ABSENT	588	98
ACUTE APICAL PERIODONTITIS	PRESENT	214	35.7
	ABSENT	386	64.3
CHRONIC APICAL PERIODONTITIS	PRESENT	68	11.3
	ABSENT	532	88.7
ACUTE APICAL ABSCESS	PRESENT	36	6
	ABSENT	564	94
OTHERS	PRESENT	33	5.5
	ABSENT	567	94.5

TABLE -3 - Frequency distribution based on the tooth involved in RCT

TEETH INVOLVED		FREQUENCY	%
CENTRAL INCISOR	PRESENT	62	10.3
	ABSENT	538	89.7
LATERAL INCISOR	PRESENT	43	7.2
	ABSENT	557	92.8
CANINE	PRESENT	33	5.5
	ABSENT	567	94.5
1 ST PREMOLAR	PRESENT	43	7.2
	ABSENT	557	92.8
2 ND PREMOLAR	PRESENT	90	15
	ABSENT	510	85
1 ST MOLAR	PRESENT	172	28.7
	ABSENT	428	71.3
2 ND MOLAR	PRESENT	97	16.2
	ABSENT	503	83.8
3 RD MOLAR	PRESENT	23	3.8
	ABSENT	577	96.2

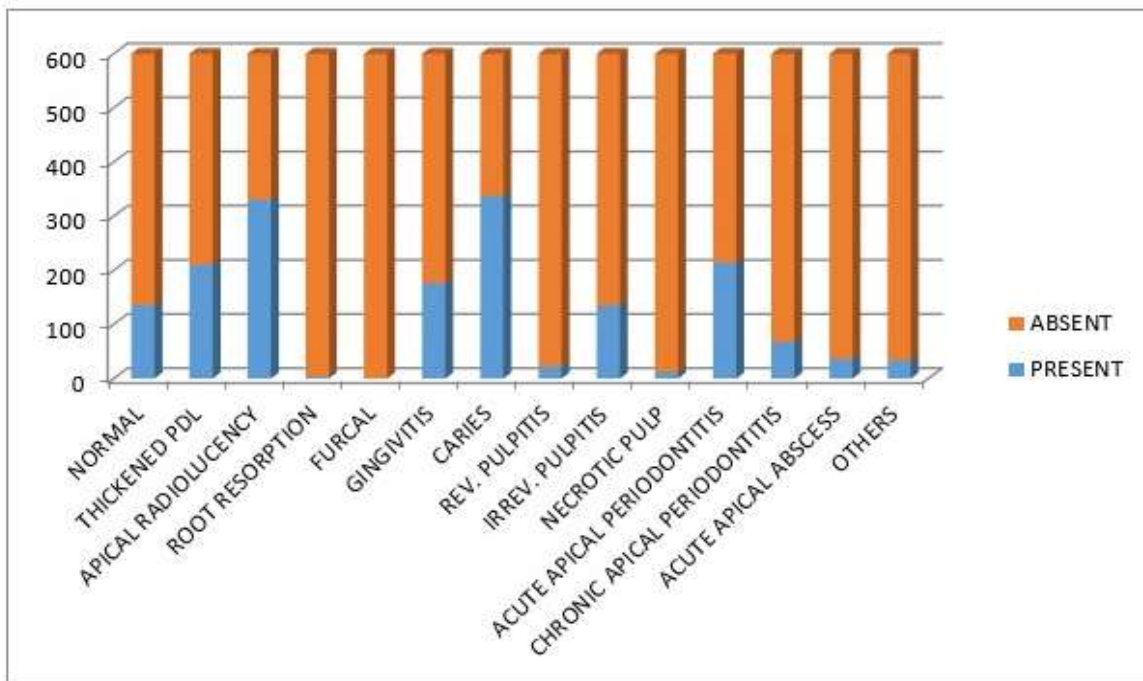


IMAGE -1 FREQUENCY DISTRIBUTION OF DISEASES OF TOOTH

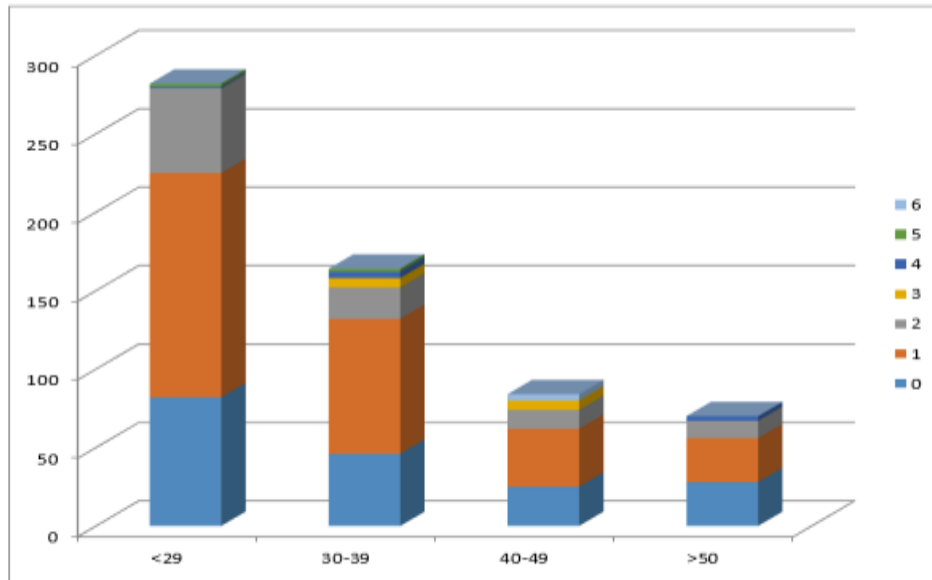


IMAGE -2 FREQUENCY DISTRIBUTION OF NUMBER OF RCT BASED ON AGE

DISCUSSION

The primary objective of this study was to identify variables affecting the likelihood of endodontic intervention under various conditions such as age, gender, and various tooth problems present or absent, based on the type of tooth involved, number of RCT based on gender and age.

The frequency of male patients was higher as compared to females in our study. It was more, than the studies done by the Washington study¹³ (36%) the Serene and Spolsky (45 %) ¹⁴ and Wayman et (58 %). However, there are two variables which could affect the frequencies. The active-duty personnel and retired beneficiaries were predominately male, whereas the vast majority of spouses were female patients.¹⁵

Comparing restoration with and without apical periodontitis, males with root canal-treated maxillary incisors with restoration and apical periodontitis (28.2%) were less common than males treated with restoration without apical periodontitis (71.8%). Similarly, females with root canal-treated maxillary incisors with restoration and apical periodontitis (40.2%) were significantly less common than females with root canal-treated teeth with restoration and without AP (56.1%).¹⁶

On comparison of root canal pathologies under various conditions it was found that thickened pdl, apical radiolucency, gingivitis, caries, increases the chances for a root canal treatment.

However, root resorption, furcation involvement, necrotic pulp, acute apical periodontitis and chronic apical periodontitis, are factors which shows less frequencies to teeth to undergo RCT in our study.

On comparison of the tooth involved in RCT, first molar were the most commonly involved teeth in RCT compared to third molar which were least involved. It was contrary to the study done by Al-Negrish¹⁶ who stated that most frequently treated was the maxillary central incisor (39.6 per cent) with maxillary lateral incisor as second (10.1 per cent), which compares favorably with the Washington study¹⁶ (27.1 per cent) for the maxillary central incisor, and with the maxillary lateral incisor second (18.8 per cent). The Wayman study however, found that the tooth treated most frequently was the mandibular first molar (18.8 per cent) which is similar to our study¹⁵, also in UCLAE study in which the mandibular first molar was treated most often (18.1 per cent) and the maxillary first molar was the second most frequently treated tooth (13.5 per cent)¹⁴. In the current study the first molar was the most frequently treated tooth.

On the basis of previous restorations, in a retrospective study done by Barthel CR et al of 123 carious teeth that had been pulp capped, 44.5% had failed after five years and 79.7% had failed after ten years. It was contrary to our study in which the teeth with restoration were very less likely to undergo RCT.¹⁷

As like Umanah A et al study we found in our study the people below the age of 29 were in need of Root canal treatment more than other groups.¹⁸

A careful clinical and radiographic evaluation is always required in the first instance to determine if a tooth

is restorable or if endodontic procedures are first required and will allow planning for the optimum design of restoration in each case.¹³

Such surveys help us to determine the prevalence of root canal treatment in the population of a particular area. But it could be compromised by factors such as poor oral hygiene, any systemic conditions, lack of correct diagnosis. So further research should be done to get more information on the incidence of root canal treatment being received by the population of Bhopal.

CONCLUSION

The first molars were the most frequently found for undergoing RCT in both the arches followed by second molar & second premolar. Periapical lesions showed an almost similar pattern among teeth with a higher number of radiolucencies found in the 1st molar in both the arches followed by second molar.

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