Prevalence of endodontically treated teeth in Sulaimani adult population

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Abstract

Objectives: The aim of this study was to determine the prevalence of root filled teeth in a Sulaimani adult population.

Material and Methods: Panoramic radiographs of 1015 patients were examined for the presence of endodontically treated teeth between April 2009 and October 2014. Two independent examiners discussed interpretation criteria and classified specimens according to the following data: presence of root canal treatment, which was defined as partially or completely filled canal space, regardless of whether filling ended at the radiographic apex or not; presence of intracanal post; and associated apical periodontitis.

Results: Chi-square test and descriptive analysis were used for statistical analyses. Significance level was set at $p<0.05$. Of 24218 teeth evaluated, 4534 (18.7 %) were treated endodontically. Endodontic treatment was most frequent in mandibular molars, whereas mandibular incisors showed the lowest. Most endodontically treated teeth were found in people aged 18-29 years old. Females (54.29%) showed a higher prevalence of teeth with root fillings than males.

Conclusions: The present study found a higher prevalence of endodontically treated teeth in lower molars; females had more endodontically treated teeth than males.

Keywords: *endodontic treatment, root canal filling, apical periodontitis, endodontic epidemiology.*

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Introduction:

Development in preventive dentistry has led to increasing the durability and functioning maintenance of dentition particularly in elder population [(1)].

Dental pulp and periodontium have a close relationship during tooth development. Direct vascular communication between the pulp and the periodontium forms during tooth development. They communicate through the apical foramen and accessory canals [(2)].

Bacteria and their by-products can spread into periapical tissues after ingression dental pulp by dental caries and trauma. An immune response will develop in the periapical tissue aiming at overwhelming the infection. The aim of root canal treatment is to protect the periapical area from getting an infection and allow proper healing of the lesion that happened before treatment [(3)].

Different epidemiological studies have been done on prevalence and conditions of the periapical periodontal tissues of root-filled teeth in population. Some studies assessed the total number of endodontically treated teeth, while others concentrating on the number of persons with endodontic treatment in the population and finally presence and absence of periapical periodontitis in endodotically treated teeth[(4-7)].

One study in Spain [(8)] shown that the prevalence of apical periodontitis of root filled and untreated teeth and the frequency of root-filled teeth in adult Spanish population were similar to those had been taken in other European countries. A similar study [(9)] for the same purpose in Japan showed a higher prevalence of root-filled teeth than in Europe or America. Another study in Argentina [(10)] showed that the higher prevalence of root-filled teeth in females than males and molars and premolars were in need of root canal treatment.

Considering the importance of epidemiological investigations, the aim of this study was to determine the prevalence of endodontically treated tooth in relation to age and gender in Sulaimani adult population.

Materials and Methods:

1015 panoramic radiographs were examined for the presence and absence of endodontically treated teeth. Of which 464 were male, and 551 were female. The age inclusion was from 18 and above. Radiographs were retrieved from documents of two private dental radiology centers. The stored files of between April 2009 and October 2014 were taken for this study.

Every panoramic image was examined by two independent examiners who had experience in dental radiology for more than 5 years. They examined all the teeth except third molars for the presence and absence of radiopaque materials in the dental pulps of endodontically treated teeth. For multi-rooted teeth, even one treated root had been included in the study. Complete or incomplete treated teeth, the fillings reached radiographic apices or not, presence or absence of intracanal post and presence and absence of periapical radiolucency, were all included in the study.

The Chi-square test and descriptive analysis were used for statistical analyses. Significance level was set at $p<0.05$.

Results:

Of 1015 cases (24218) evaluated teeth, 4534 (18.7 %) had been treated endodontically. Tables 1 & 2 show the distribution of endodontically treated teeth according to age and gender. Table 3 shows the prevalence and distribution of root canal treatment according to the tooth type.

Statistically, there is a highly significant association between types of the teeth and endodontic treatment ($P<0.001$).The mandibular first molars were the most frequently treated endodontically, whereas mandibular incisors showed the lowest. The largest number of endodontic treatments was found among individuals aged 18 to 29 years (30.74%). Females (54.29%) showed the greatest prevalence table (2).

Table 1: Prevalence of endodontic treatment according to age.

Age distribution	Number of cases	Percent
18-29 years	312	30.74%
30-39 years	277	27.29%
40-49 years	244	24.04%
50 years & over	182	17.93%
Total	1015	100.00%

Table 2: Prevalence of endodontic treatment according to gender.

Sex	No.	Percent
Male	464	45.71%
Female	551	54.29%
Total	1015	100.00%

Discussion:

This study was done to evaluate the prevalence of distribution and frequency of endodontically treated teeth in relation to the gender and age. This study has been done due to the lack of information on the prevalence of endodontic tooth treatment in Sulaimani Governorate.

In this study, panoramic radiography was used to account endodontically treated teeth without evaluating periapical status [11]. Panoramic radiographs were used because they show all the teeth on a single film, and the patient requires less radiation compared with multiple irradiations of periapical radiographs [7]. One of the great advantages of this study was that no patient had been obliged to expose to radiation. The saved panoramic image files were used that had been taken for different purposes [7].

The results of this retrospective study were similar to the previous studies [8,12], in which females had significantly more remaining natural teeth than males. The average number of root-filled teeth was also lower among males than females in contrary to the studies done by (Kamberi et al.) [3] and (Tareen et al.) [13]. They reported that the prevalence of endodontically treated teeth was significantly higher in males than the females. One explanation for our study may be related to socio-psychological aspects of females as they attend dental clinics seeking dental treatment more frequently than males. Our results also showed a higher number of panoramic images in females than males.

The first molar teeth showed the most frequently treated teeth endodontically while the lower incisors showed the least. The similar findings can be found in these (Tavares et al. [14], Ahmed et al. [15] and Kamberi et al. [3]) studies. Posterior teeth showed more endodontically treated teeth than anteriors and this difference significant statistically ($p < 0.001$).

This study also showed a higher prevalence of root canal treatment in age group (18-29) years that constitutes (30.74%) and this percentage were decreasing with advancing age. Similar results had been achieved by (Bodrumlu et al.) [16] in which higher percentage of endodontic treatment were located in the (18-29) of both genders. In addition to high caries risk in this age group than the elders, there are some other factors may impose effects on this prevalence. In recent decades, there have been great improvements in social, economic and political stabilities concomitantly with dental educational improvements among populations in this region. These improvements have passed linearly with increasing numbers of dental health centers and endodontic specialists.

Table (3): Prevalence of endodontic treatment according to the dental group.

Tooth type	With endodontic treatment		Without endodontic treatment		Total		X^2
	No.	%	No.	%	No	%	
11	109	14.0	671	86.0	780	3.2	
12	133	17.1	643	82.9	776	3.2	
13	87	9.9	792	90.1	879	3.7	
14	122	16.6	614	83.4	736	3.1	
15	136	18.6	597	81.4	733	3.1	
16	314	36.3	552	63.7	866	3.6	
17	91	12.9	612	87.1	703	2.9	
21	106	13.8	663	86.2	769	3.2	
22	121	16.5	611	83.5	732	3.0	
23	98	13.9	605	86.1	703	2.9	
24	124	17.0	605	83.0	729	3.0	
25	141	19.3	591	80.7	732	3.0	
26	321	39.3	495	60.7	816	3.4	X2= 2778
27	93	12.8	632	87.2	725	3.0	d.f= 27
31	21	2.3	873	97.7	894	3.7	P <0.001*
32	27	2.9	891	97.1	918	3.8	
33	78	8.1	882	91.9	960	4.0	
34	114	13.3	743	86.7	857	3.6	
35	213	23.8	682	76.2	895	3.7	
36	593	47.6	654	52.4	1247	5.2	
37	193	20.9	732	79.1	925	3.9	
41	19	2.2	864	97.8	883	3.7	
42	23	2.6	853	97.4	876	3.6	
43	67	7.1	871	92.9	938	3.9	
44	131	15.5	712	84.5	843	3.5	
45	239	25.5	698	74.5	937	3.9	
46	611	48.8	641	51.2	1252	5.2	
47	209	22.8	708	77.2	917	3.8	
Total	4534	18.9	19487	81.1	24021	100	

* Highly significant association.

Conclusions:

In the present study, females had more endodontically treated teeth than males. Endodontic treatment was most frequent in mandibular molar, and lower incisors are least frequent. Most endodontically treated teeth were found in 18-29-year-olds.

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