



Prevalence and reasons for tooth extraction among adult patients attending the Teaching Hospital at College of Dentistry/ Mustansiriyah University

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Abstract

Background: In light of all the current advances in dental restoration, tooth extraction is one of the last options in dental treatment and yet the number of patients needing dental extraction is still high. The aims of this study are to determine the reasons and pattern of teeth extraction among adult patients attending the Oral Surgery clinic at College of Dentistry/ Mustansiriyah University and to study the correlation between the reasons of teeth extraction and patient's age, gender and tooth position

Materials and Methods: The present study included 2165 patients (2500 teeth were extracted) attending Oral Surgery clinic of the teaching hospital at College of Dentistry/ Mustansiriyah University during the period from October 2016 to May 2017. The patients' ages ranged between (15-77 years). A standard case sheet for Oral Surgery clinic was filled with all the necessary information such as age, gender, tooth to be extracted and reasons of tooth extraction.

Results: Dental caries and its complications were the primary cause of teeth extraction with (80.3%) followed by periodontal diseases (13.4) and other causes (6.4%). Tooth extraction due to dental caries was higher in males (59.2%) than females (40.8%). Tooth extraction due to periodontal diseases was also high in males (72.2%) compared to females (27.8%) with high significance ($p = 0.000$). In age groups 30-39 years and 40-49 years, extraction due to dental caries was found equally high being 22.4%, while extraction due to periodontal diseases was high in age group ≥ 60 (38.3%) and in age group 50-59 (32.6%) with high significance ($p = 0.000$). Extraction of maxillary posterior teeth constituted (44.9%) and mandibular posterior teeth (37.8%), the posterior teeth were the most common teeth extracted because of caries, while mandibular anterior teeth (27.5%) followed by maxillary posterior teeth (26.6%) were the most common teeth extracted due to periodontal diseases with high significance ($p = 0.000$).

Conclusion: Dental caries was the primary cause for tooth extraction followed by periodontal diseases. There was a significant correlation between the reasons for tooth extraction and the patient's gender, age and tooth position. The study showed the need for a comprehensive preventive plans and effective educational campaigns to reduce the need for tooth extraction among adults and increase patient's awareness toward better oral health status.

Keywords: Tooth extraction, dental caries, periodontal disease.

Introduction

Tooth extraction is one of the most common dental procedures performed routinely in dentistry for centuries. However tooth preservation is fundamental for social life, proper function, psychological status and economical purpose ⁽¹⁾. An understanding of the prevalence, the causes and the pattern of teeth extraction is imperative for oral health enhancement ⁽²⁾.

According to the geographical location, the prevalence of dental diseases and the pattern of tooth extraction were different. Dental caries was the main cause of tooth extraction followed by periodontal diseases in many studies in different countries ⁽¹⁻¹⁰⁾, while in other countries the periodontal diseases were the main cause for tooth extraction followed by dental caries ⁽¹¹⁻¹³⁾. Studies in Italy and Singapore showed that dental caries and periodontal disease percentages were approximately the same for tooth extraction ^(14, 15).

Regarding the pattern of tooth extraction, a study in United Arab Emirates (UAE) showed that 59.3% of the patients seeking tooth extraction were males and 40.7% were females. The highest frequency of tooth extraction was found in the twenties age group (28.1%), while the elderly patients (71 years and above) were the lowest (0.4%). The most common teeth extracted were the upper molars (26.98%), followed by the lower molars (25.1%), and the least common teeth are the supernumerary teeth (0.31%) ⁽¹⁶⁾.

In Iran, a study showed that the percentage of female patients was (55%) and male patients' percentage was (45%). The most frequent age group was 20 – 30 years (24.8%). the

distribution of the extracted teeth were (49.2%) from the mandible, (45.3%) from the maxilla and (5.5%) from both ⁽⁴⁾.

In Nepal, a study reported that 54% of the patients seeking extraction were females and 46% were males. Above 30 years of age had high percentage of tooth extraction (79.1%) while 30 years old and below had (20.9%). The first permanent molar (66.1%) was the most common tooth extracted as a result of dental caries, while the central incisors (87.9%) was the most common tooth extracted due to periodontal disease ⁽¹⁾.

A study in Saudi Arabia with 1554 patients (691 males and 863 females) found that dental caries was the main cause for extraction (50.2%) followed by extraction for orthodontic reasons (18.2%) while periodontal disease constituted (8.2%) of all extractions. Molar teeth (60%) were most frequently extracted followed by premolars and anterior teeth ⁽¹⁷⁾.

In a previous study in Iraq carried by AL-Droubie in 2006 showed that females had more teeth extraction than males (233 females, 137 males). The highest percentage of tooth extraction was (22.4%) in age group 15-25 years. The first molar was the most common tooth extracted (21%) ⁽¹⁸⁾.

The aims of this study are to determine the prevalence, reasons and pattern of teeth extraction among adult patients attending the Oral Surgery clinic at College of Dentistry/ Mustansiriyah University and to detect which age group, gender and tooth position that have the highest extraction percentage to get a database to use in planning for education and awareness campaigns and to give information and instruction to different

Iraqi societies especially the most frequently affected segments of the community focusing on the reason of the extraction.

Materials and methods

This study was carried out on patients attending Oral Surgery clinic of the teaching hospital at College of Dentistry/ Mustansiriyah University. The study was conducted during the period from October 2016 to May 2016. A total of 2165 patients (2500 teeth extracted) were included during the period of this study. Surgical teeth extractions and incomplete case sheets of extractions were excluded from the current study.

For each patient, a standard case sheet for Oral Surgery clinic was filled with the following patient's basic information such as: age, gender, tooth to be extracted, reasons for tooth extraction (caries and its complications -pulpitis, crown fracture, abscess, restorative and endodontic failure-, periodontal disease, others -for prosthetic restoration, for orthodontic treatment, financial reasons and extraction due to trauma-), patient's current systemic health status, clinical examination and investigations.

A clinical examination on the accused tooth was carried out for each patient using a dental mirror and probe. Some patients were in need for further investigations such as periapical or panoramic radiographs to confirm the presence of a periapical or periodontal or general bony defects. A proper diagnosis was reached (after taking in consideration the patient's dental and medical history and the clinical findings during examination and investigation) and recorded in the case sheet.

All the patients signed an informed consent as routine procedure in the Oral Surgery clinic of the teaching

hospital at College of Dentistry/ Mustansiriyah University. All the extractions were performed under local anesthesia.

The collected data were statistically analyzed using computer software SPSS 24 to find the prevalence of tooth extraction and to see if there is any association between variables like (patient's age, gender and tooth position) with the reason of extraction. Chi-square test was applied to identify the significance differences and 0.05 level of significance was the standard p-value.

Results

The present study included 2165 patients with a total of 2500 teeth were extracted. The patients' ages ranged between (15-77 years) with a mean age of (44 years), the male and female percentages were (60.5%) and (39.5%) respectively. Dental caries and its complications were the primary cause of teeth extraction with (80.3%) followed by periodontal diseases (13.4) and other causes (including for prosthetic treatment, orthodontic treatment and trauma) (6.4%) (Table 1).

Table 2 shows the analysis according to gender, dental caries percentages were found higher in males (59.2%) than females (40.8%). Periodontal diseases also showed higher percentage in males (72.2%) compared to females (27.8%). There was a highly significant difference in the reason for extraction between males and females ($p= 0.000$).

The distribution of Reason for extraction according to the age groups is demonstrated in (Table 3). Dental caries percentages were found equally higher in the age groups of 30-39 years and 40-49 years being 22.4% followed by age group 50-59 years (21.3%), 20-

29 years (17.4%), ≥ 60 years (14.3%), and < 20 years (2.2%). While periodontal diseases showed higher percentages in age groups ≥ 60 years (38.3%) and 50-59 years (32.6%) followed by age group 40-49 years (15.6%), 30-39 years (13.5%), other causes were higher in age groups 50-59 years (24.5%) and ≥ 60 years (20.1%) followed by age groups < 20 years (17.0%), 40-49 years (15.1%), 20-29 years (11.9%), 30-39 years (11.3%). The distribution of reasons for extraction according to the age groups was highly significant with ($p = 0.000$).

Table 4 shows the distribution of reasons for extraction according to the tooth position which revealed a higher percentage of teeth extracted due to caries in the maxillary posterior teeth (44.9%) followed by mandibular posterior teeth (37.8%), maxillary anterior teeth (12.8%) then mandibular anterior teeth (4.5%). The results also showed that the percentage of teeth extracted because of periodontal diseases was higher in mandibular anterior teeth (27.5%) followed by maxillary posterior teeth (26.6%), mandibular posterior teeth (23.1%) then maxillary anterior teeth (22.8%). Other causes of extraction showed similar pattern to caries distribution being higher in maxillary posterior teeth (50.3%) followed by mandibular posterior teeth (32.7%), maxillary anterior teeth (10.1%) then mandibular anterior teeth (6.9%). The distribution of reasons for extraction according to the tooth position was highly significant with ($p = 0.000$).

Discussion

The results of the present study showed that dental caries was the primary cause for tooth extraction followed by periodontal diseases. The

results were in agreement with the results of previous studies in Iraq carried out by AL- Droubie⁽¹⁸⁾ and AL Azzawi⁽¹⁹⁾ and also in agreement with the results of other studies in the region, in Iran^(2, 4), Kuwait⁽³⁾ and UAE⁽¹⁶⁾. Although in Saudi Arabia⁽¹⁷⁾ the presence of caries was observed to be the main cause of extraction but the second most common cause of tooth extraction was for orthodontic problems.

Similar results to the current study were also found in other countries, in Nepal⁽¹⁾, Greece⁽⁵⁾, Brazil^(6, 8), North of Afghanistan⁽⁷⁾, South Wales (in the United Kingdom)⁽⁹⁾, Taiwan⁽¹⁰⁾ and south India⁽²⁰⁾. While other studies in Japan⁽¹¹⁾, Jordan⁽¹²⁾ and Canada⁽¹³⁾ found that periodontal diseases were the primary cause for tooth extraction followed by dental caries. Studies in Italy⁽¹⁴⁾ and Singapore⁽¹⁵⁾ showed that both dental caries and periodontal disease were relatively equally responsible for tooth extraction. These different results could be due to the variations of patient's diet, oral hygiene and dental education level, social and economical factors as well as fluoridation of water in these countries⁽⁴⁾.

The current study found that extraction of teeth due to dental caries, periodontal diseases and other reasons for extraction was higher in males than females with a high significance. This finding agrees with Jafarian and Etebarian⁽²⁾ who found more extraction due to dental caries and periodontal diseases in males than females. The study findings suggest that males tend to neglect their teeth without seeking to restore them leading to the need for extraction as the only solution for their dental problem while females pay more attention to their dental health and tend to preserve their teeth by restorative treatment and only

accept extraction as a last solution of dental treatment.

Several studies conducted by Al-Shammari et al⁽³⁾, Lee et al⁽¹⁰⁾, Aida et al⁽¹¹⁾, Thomas and Al-Maqdassy⁽¹⁶⁾ and Al- Droubie⁽¹⁸⁾ found that tooth extraction due to periodontal diseases was more in males than in females (similar to the current study) but they also found that dental caries was more in female than in male (contrary to the current study).

The study results disagree with the findings of Alesia and Khalil⁽¹⁷⁾ who showed more extractions because of caries in females compared with males. The study results also disagree with Jarahi et al⁽⁴⁾ who found dental caries, in males and females, was the most common reason for tooth extraction. While Dixit et al⁽¹⁾ found that there was no relationship between gender and dental diseases.

The current study results showed that the percentage of dental caries was found equally high in the age groups of 30s and 40s followed by age groups of 50s, this may be attributed to patients carelessness to restore their teeth in early stages leading to more serious complications (chronic pulpitis, abscess, crown fracture due to weak tooth structure) and more radical treatment (tooth extraction). While the percentage of periodontal diseases was higher in age groups ≥ 60 s and 50s. It's obvious that among old age group, the main reason for teeth extraction was the periodontal diseases as it was one of the most common oral diseases in old age. This is due to periodontal disease progression, general medical health (chronic diseases like diabetes), lifestyle habits (smoking, stress) and bad oral hygiene⁽¹⁸⁾.

The findings of the present study were in agreement with Da'ameh⁽⁷⁾ and Thomas and Al-Maqdassy⁽¹⁶⁾ who found that caries was the principal

cause for tooth extraction in patients 50 years of age or less and periodontitis was directly related with age, being the main reason for tooth extraction in patients above 50 years of age.

Our results also agree with, Montandon et al⁽⁸⁾, Aida et al⁽¹¹⁾ and AL- Droubie⁽¹⁸⁾ who found that caries was the most common reason for tooth extraction among young and adults up to 44 years old, while the periodontal disease was the principal cause for extractions from 45 years and above.

The study outcomes partially agree with Al-Shammari et al⁽³⁾, Chrysanthakopoulos⁽⁵⁾ and Ong et al⁽¹⁵⁾ who found that caries was the main reason for extraction in patients with ages of ≤ 40 years old, while periodontal disease was the main reason of extractions in patients with ages of ≥ 40 years old.

The study results disagree with Dixit et al⁽¹⁾ who reported that dental caries was the principal cause for tooth extraction in age groups < 30 years, while in age groups > 30 years; periodontal disease was the main reason for extraction of teeth and also disagree with Jafarian and Etebarian⁽²⁾ who found that dental caries was still the principal cause for tooth extraction even in old patents, but to a less degree than in younger patients. The current results were in disagreement with the results of Lee et al⁽¹⁰⁾ who observed that tooth extraction due to dental caries was commonly observed in all age-groups, while tooth extraction due to periodontal disease increased in patients above than 35 years.

The results showed higher percentage of teeth extracted due to caries in the maxillary posterior followed by mandibular posterior while teeth extracted due to periodontal diseases showed higher percentage in mandibular anterior followed by maxillary posterior. These

findings agree with Thomas and Al-Maqqassy⁽¹⁶⁾ who found that the most common teeth extracted due to caries were the maxillary molars followed by the mandibular molars mainly, and that mandibular anterior teeth were the most common teeth extracted due to periodontitis. The results also agree with Ong et al⁽¹⁵⁾ who found that posterior teeth were more commonly extracted compared to anterior teeth, molars were frequently extracted due to caries and mandibular anterior teeth were often extracted due to periodontal diseases. The findings were in agreement with of Angelillo et al⁽¹⁴⁾ who found that the most frequently extracted teeth due to dental caries were the posterior teeth and more than half of the anterior teeth were extracted for periodontal reasons.

The results were in agreement with Dixit et al⁽¹⁾ found that the first and second molars were the most frequently extracted teeth due to dental caries and its sequel. The study results agree with Jarahi et al⁽⁴⁾ who found that periodontal disease was the main reason of tooth extraction in incisors and with Aida et al⁽¹¹⁾ who showed that mandibular central and lateral incisors were the most frequently extracted teeth due to periodontal diseases.

The study findings partially agree with Al-Shammari et al⁽³⁾ who found that molars and maxillary premolars were more frequently extracted due to caries, while mandibular premolars and maxillary and mandibular anterior teeth were more frequently extracted due to periodontal diseases. Our findings also partially agree Chrysanthakopoulos⁽⁵⁾ who found that maxillary and mandibular first and second molars were the most commonly extracted teeth due to dental caries. Maxillary anterior teeth and mandibular anterior and premolar teeth

were the most commonly extracted teeth due to periodontal diseases.

The results disagree with Alesia and Khalil⁽¹⁷⁾ who showed that extractions due to caries followed by eruption problems then periodontal disease were more common in posterior teeth than anterior teeth, and the main reason for anterior teeth extraction was dental caries and then periodontal disease.

Conclusion

The study concluded that dental caries was the primary cause for tooth extraction followed by periodontal diseases. There was a significant correlation between the reasons for tooth extraction and the patient's gender, age and tooth position. The study showed the need for a comprehensive preventive plans and effective educational campaigns to reduce the need for tooth extraction among adults and increase patient's awareness toward better oral health status.

Recommendations

Patient's motivation and dental education play a primary role in the reduction of tooth extraction. The study shows that further preventive and educational campaigns are essential to reduce tooth extraction among the population. The outcome of the study also revealed the importance of paying more attention by dental students and their teachers towards giving the patients more instruction and motivation to treat different dental problems in early stages especially dental caries and periodontal diseases and to improve the oral health status and this goal is implemented by encouraging the patients toward more regular check-up visits to the dentist.

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Table 1: Frequency and percentages of tooth extractions according to the reason for extraction

Reason for extraction	Frequency (N)	Percent (%)
Dental caries	2007	80.3

Periodontal diseases	334	13.4
Other	159	6.4
Total	2500	100.0

Table 2: Frequency and percentages of Reason for extraction according to the gender

Reason for extraction	Gender		Total% (N)
	Male% (N)	Female % (N)	
caries	59.2% (1188)	40.8% (819)	100.0% (2007)
periodontal diseases	72.2% (241)	27.8% (93)	100.0% (334)
other	52.8% (84)	47.2% (75)	100.0% (159)
Total	60.5% (1513)	39.5% (987)	100.0% (2500)

Table 3: Frequency and percentages of Reason for extraction according to the age groups

Diagnosis	Age group						Total
	< 20	20-29	30-39	40-49	50-59	≥60	
caries	2.2% (44)	17.4% (350)	22.4% (450)	22.4% (450)	21.3% (427)	14.3% (286)	100.0% (2007)
periodontal diseases	0.0% (0)	0.0% (0)	13.5% (45)	15.6% (52)	32.6% (109)	38.3% (128)	100.0% (334)
other	17.0% (27)	11.9% (19)	11.3% (18)	15.1% (24)	24.5% (39)	20.1% (32)	100.0% (159)
Total	2.8% (71)	14.8% (369)	20.5% (513)	21.0% (526)	23.0% (575)	17.8% (446)	100.0% (2500)

Table 4: Frequency and percentages of Reason for extraction according to the tooth position

Diagnosis	Tooth position				Total
	Max. ant.	Max. post.	Mand. ant.	Mand. post.	
caries	12.8% (256)	44.9% (902)	4.5% (91)	37.8% (758)	100.0% (2007)
periodontal diseases	22.8% (76)	26.6% (89)	27.5% (92)	23.1% (77)	100.0% (334)
other	10.1% (16)	50.3% (80)	6.9% (11)	32.7% (52)	100.0% (159)
Total	13.9% (348)	42.8% (1071)	7.8% (194)	35.5% (887)	100.0% (2500)