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A STUDY OF EXODONTIA IN ARMED FORCES INSTITUTE OF DENTISTRY RAWALPINDI

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ABSTRACT

Objective: To determine the etiology of tooth extraction in the Patients reporting to Armed Forces Institute of Dentistry.

Study Design: Cross-sectional study.

Place and Duration of Study: Oral and Maxillofacial Surgery Department, Armed Forces Institute of Dentistry (AFID), Rawalpindi, from Jun 2015 to Sep 2015.

Methodology: A total number of 10131 patients reported at the diagnostic department of Armed Forces Institute of Dentistry (AFID) for treatment. Out of them 1769 patients were referred to Oral and Maxillofacial surgery department for tooth extraction. Twenty doctors consulted these patients, three of them classified Oral and Maxillofacial surgeon and the rest of the 17 were postgraduate residents. The patients were divided into three age groups; below 30 years of age, between 30 and 60 years of age and above 60 years of age. The reasons for exodontia were assigned to nine groups.

Results: A total of 2, 167 teeth were extracted in 1, 769 patients (1.23 ± 0.07 teeth per patient), ranging in age from 4 years to 76 years. Overall, dental caries and its sequelae were the most frequent reason for tooth extraction (62.7%), followed by periodontal disease (22.6%). Males were 70.5% and females formed 29.5% of the patients.

Conclusion: Our study indicates that tooth extraction is still very commonly practiced in our society. Dental caries and its sequelae is the leading cause of tooth loss reflecting poor oral hygiene standards and practices adopted by our population.

Keywords: Dental caries, Extraction, Periodontal diseases, Teeth.

INTRODUCTION

Exodontia or Extraction of a tooth is as old as dental medicine itself. For centuries tooth loss was considered an inevitable part of life and the end product of dental diseases especially dental caries and periodontal problems. Improvement in restorative dentistry, attitudes toward teeth retention, increased awareness and the prevention of oral diseases have led to increased tooth preservation in many parts of the world. However in developing countries like Pakistan, extraction is still considered as the only treatment for many tooth ailments. Loss in the number of teeth result in poor dietary habits and deterioration of quality of life[1-4]. Investigating the reasons for tooth extraction in a population is a very important measure to provide information about the prevalence of dental disease, availability of dental care services, and attitude towards dental extraction. This information will also help us to plan adequate dental health policies. However, decision-making regarding extraction of many teeth are influenced by many non disease factors including dental visits, habits, and the socioeconomic status of patients. Because of the less awareness regarding dental diseases and low socio economic conditions the patients usually do not visit the dentist for treatment until and unless there is no other substitute for the progressive disease but extraction. The restorative and preventive facilities for orodental diseases are very sparse in the government hospitals and the dental teams available at most of the government hospitals are fraught with acute shortage of workforce, equipment, dental materials, medications and funds. This is added by the lack of awareness of the pop-

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ulation about oral hygiene measures and dental disease and they seldom turn up for followups if one tries to out smart the confronting difficulties and attempts at some restorative or preventive dental procedures. There are many well known reasons for tooth extractions; the common ones are dental caries, periodontal diseases, orthodontic grounds, prosthodontic reasons and surgical indication[5-10].

Armed Forces Institute of Dentistry (AFID) is the home of dentistry and the only tertiary care hospital for armed forces of Pakistan. Also it receives patients from all over the country therefore this study can be considered as a diverse study representing almost every part of Pakistan. Moreover AFID is imparting comprehensive and specialized treatment in all disciplines of dentistry apart from under graduate and postgraduate training. Therefore, minimum chances of misdiagnosis and error arise. Keeping in view the modern facilities regarding equipment, instruments, material, and high skill of qualified and trained faculty, only those teeth were selected for extraction, which were otherwise not possible to preserve.

METHODOLOGY

This cross sectional study was carried out at Oral surgery department of AFID. Total number of 10131 patients included by using universal sampling method and both genders of all ages attended the diagnostic department of AFID during the mentioned four months (1st June 2015 to 30th Sep 2015). Experienced general dental practitioners at the diagnostic department of the hospital consulted these patients. Sample size was calculated using WHO calculator. After brief history, clinical examination and preliminary investigation, these patients were referred to various departments of the hospital. These patients were educated about the conservative measures possible and available at the institute. 1769 patients eventually attended at Oral and Maxillofacial surgery department for tooth extraction, most of them directly referred from the diagnostic department. Some of the patients were initially referred to other depart-ments i.e, conservative dentistry department, orthodontic department, prosthetic department and periodontology department, for management. After evaluation by respective specialist some of their teeth were found indicated for extraction and they were directed to attend Oral and Maxillofacial surgery department for extrac-tion. Guidance and clearance from orthodontist was specifically sought for all the patients of young age and those requiring extraction for orthodontic reasons. At the Oral surgery depart-ment 20 doctors consulted these patients, 3 of them qualified Oral and Maxillofacial surgeons and the rest of the 17 were FCPS part II residents. After detail history, thorough clinical examina-tion and radiographic evaluation these patients were registered on a self designed survey form. Data was collected regarding age, gender, rank, tooth extracted, reason for extraction, educational status, number of teeth already extracted, attempt at restoration before attending for extraction and mode of anesthesia used. The patients were divided into three age groups; below 30 years of age, between 30 and 60 years of age and above 60 years of age. The educational standard of the patients was divided into matric and above, up to middle standard, primary education only and completely illiterate. Data regarding status of dentition was divided into; complete dentition, one tooth already extracted, two teeth already extracted, three teeth already extracted, four extractions and five or more teeth extracted pre-viously. The reasons for exodontia were assigned to nine groups: Dental caries, periodontal disease, endodontic reasons, pre-prosthetic considera-tions, supernumerary teeth, teeth associated with pathology or fracture of jaws and any other others.

Majority of patients were treated under local anesthesia as outdoor cases or day care surgery (n=1752) and only 17 patients were given treatment under general anesthesia as indoor cases. All the patients were treated/operated upon in minor oral surgery department/operation theatre of AFID. SPSS version 18 was used for the assessment of data and graphs. Descriptive

statistics of mean, median, mode and frequencies was calculated.

RESULTS

The results revealed that, 2167 teeth were extracted from 1769 patients (1.23 ± 0.07 teeth per patient), ranging in age from 4 years to 76 years. More than two third of our patients were below

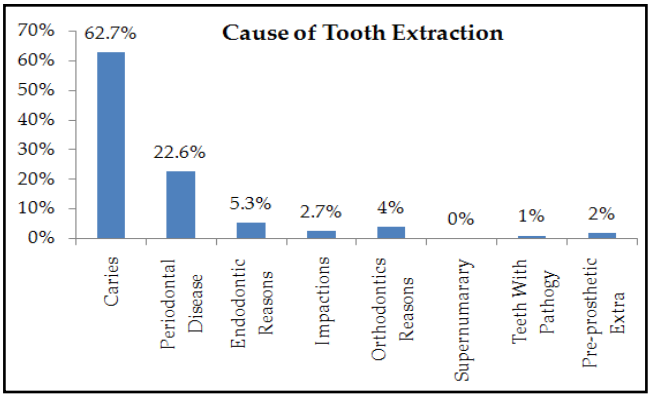

Figure-1: Distribution of patient according to cause of extraction (n=2167).

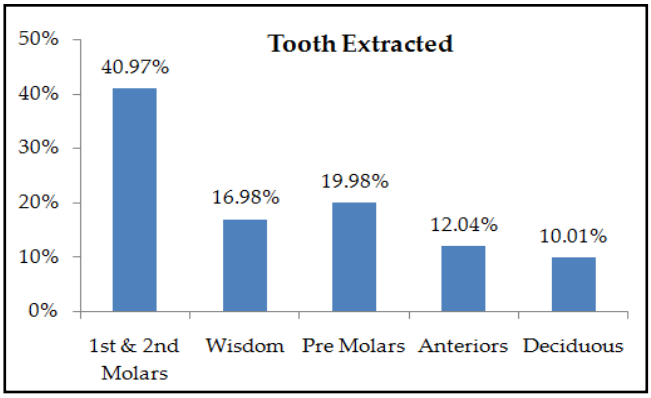

Figure-2: Distribution according the type of tooth extracted (n=2167).

30 years of age 1225 (69.3%), 460 (26%) were between 30 and 60 years of age and only 70 (4%) were above 60 years. Males were 1250 (70.7%) while females were 518 (29.3%). Overall, caries and its sequel was the most frequent reason for tooth extraction 1358 (62.7%), followed by perio-dontal disease 488 (22.6%). Multiple extractions were advised by Orthodontists especially first premolars, retained deciduous teeth, and super-numerary teeth, which accounted for 86 (4%) of extraction. Failed endodontic and cracked/ fractured teeth after endodontic treatment accounted for about 114 (5.3%) of the cases. Symptomatic impactions were removed in 58 (2.7%) of patients. Preprosthetic and oncological indications accounted for 58 (2%) and 21 (1%) respectively fig-1.

The teeth most commonly extracted were the upper and lower first and second molars (41.3%) followed by Premolars (18.6%). Upper and lower wisdom teeth were extracted in 17.4% of the cases and the anterior teeth extraction accounted for 12.6%. The share of deciduous teeth was 10% of total extractions fig-2.

The educational standard of our study population was relatively high as compared to the overall literacy rate of Pakistan. 46.8% of the patients were educated up to matric or above, 20% were middle school level educated, 22.2% were educated up to the primary level and only 11% were completely illiterate. But the educational standard was not able to increase the awareness about dental treatment and tooth preservation as 93% of the patients reported for extraction without any attempt at restoration of their teeth as compared to only 7% who tried

Table: Causes of tooth extraction carried out in different parts of the world.

Country	Year of Study	Causes of Extractions (% age)		
		Caries	Periodontal disease	Others
Nigeria (9)	1987 (8338)	3663 (43.9%)	3867 (46.4%)	808 (9.7%)
Greece (12)	1988 (600)	339 (56.5%)	64 (10.8%)	196 (32.8%)
USA (9)	1989 (3190)	1062 (33.3%)	596 (18.7%)	1531 (48%)
Caribbean (9)	1993 (2780)	1712 (61.6%)	831 (29.9%)	225 (8.1%)
Singapore (7)	1996 (2172)	768 (35.4%)	776 (35.8%)	603 (27.8%)
Italy (9)	1996 (2586)	889 (34.4%)	855 (33.1%)	581 (22.5%)
Canada (9)	1997 (3942)	1139 (28.9%)	1415 (35.9%)	1387 (35.2%)

to preserve their dentition. 26.6% of the patients reported for extraction with complete dentition with no history of previous extractions. Patients having already extracted one, two, three, four, five or more than five teeth constituted 25.4%, 22.7%, 12.6%, 6.6%, and 6% of the total extractions respectively.

DISCUSSION

In accordance to studies published by Marcenes *et al*. Kassebaum *et al*[1,2], oral diseases have been prevalent throughout the world. In permanent teeth untreated caries is categorized as the most prevalent disease in the landmark "Global Burden of Disease 2010 Study", whereas severe periodontitis and untreated carious lesion of the deciduous teeth were evaluated as 6th and 10th most prevalent diseases that affected 11% and 9% of the total world population respectively[3]. Carious lesions and severe periodontitis are rendered as the most important public health problem and quoted as the major cause of permanent tooth extraction. Loss or extraction of permanent teeth is considered as a key indicator to monitor the population's overall dental health[4].

From the foregoing data it was found that the effects of poor oral hygiene, low literacy rate, low socio-economic conditions, and insufficient dental facilities available in rural areas aggravated by the high cost of dental treatment accounted for the advanced oral diseases and ultimately loss of teeth. The highest percentage of extractions is because of dental caries due to the fact that the major part of our study population is below 30 years of age (69.3%), and the predominant cause of tooth extraction in older population is due to the periodontal diseases. The age range of our patients was from 4 to 76 years with an average age of 30 years.

According to the results only 7% of the patients seek treatment/restoration of their teeth before attending for extraction. Majority of the patients were oblivious to routine oral hygiene measures. Many of the soldiers (38%) were found having the habits of pan chewing, naswar dipping and smoking.

Although pattern of dental diseases is changing gradually, yet caries and periodontal disease still account for most of extractions performed, worldwide. However their relative contributions towards overall tooth mortality figures vary.

Most of the studies worldwide show that dental caries is the principal cause of tooth loss followed by periodontal disease. The figures for dental caries among the US population aged 20-64 was as high as 91% with 27% having untreated tooth decay[5]. Chauncey *et al*, judged caries to be the major reason for tooth loss in 33.3% of the teeth extracted in US male adults Extractions for prosthodontic reasons accounted for 31.3%. In this study periodontal diseases were responsible for only 18.7% of the extractions in this population[6]. Our study differs widely as for the figure for dental caries (62.7% in our study) is concerned but the figures regarding periodontal disease is in close range (22.7% in our study). Ong G in his study from Singaporereported that out of 2172 teeth extracted from 1276 patients, 35.8% were lost due to periodontal disease and 35.4% due to caries in Asian population there[7]. According to a study conducted in Taiwan, dental caries accounted for 5.3% of extractions, followed by 22.1% of periodontal diseases related extractions[8]. Dental caries related extractions were commonly observed in all age groups, whereas the trend in above 35 years old patients was more inclined towards periodontal diseases related tooth removal[8]. Our study findings also confirm this trend. Oginni[9], studied the causes and pattern of tooth mor-tality among Nigerians and concluded periodon-tal diseases and dental caries as the two main causes of tooth loss. Another study conducted in Saudi Arabia in 2017 illustrated similar kind of results that caries and sequelae related to cariesin 63.4% of the population, was the primary reason for people opting for extraction in all age groups, whereas periodontal diseases related extractions were common in people aged 40 years and above (14.6%)[10].

On the other hand, a study conducted in Aden, Yemen, concluded that periodontal diseases caused most of the extractions (51.1%) in the population older than 40 years of age, as compared to dental caries related extractions accounting for 33.1% of total extractions which were more common in age groups below 40 years of age[11-14]. The comparison of various studies regarding causes of tooth extraction carried out in different parts of the world is given in table.

Dental caries and sequelae are commonly observed in all age groups particularly in the individuals aged above 15 years. Caries occur throughout the life of the dentate patients with coronal caries being more prevalent in the younger people as compared to root carious lesions more common among the aged population[15]. Our study shows that 22.7% of the extractions were carried out due to periodontal diseases whereas previously conducted studies suggest that 10.8% to 65% of extractions were done due to periodontal diseases. Hence, the result of 22.7% of our study conveniently agrees with the already established pattern worldwide that is periodontal disease is the most common reason for tooth extraction in the age group of 45 yrs and above[18]. The natural process of aging is not responsible for causing severe periodontitis and removal of teeth due to severe periodontitis may take place in a small number of patient population. So a very few patients with severe periodontitis may lose many teeth and visible as a significant number statistically. According to Phipps and Stevens[19], 51% of tooth extractions were carried out because of periodontal problems while caries caused 35.4% of them. However, considering patients as a unit for analysis, extractions done due to carious lesions accounted for 58% of the total whereas 40% were done due to periodontal diseases. Keeping in view these facts, it is important to devise an effective strategy to promote awareness about periodontal health, especially in the age group of 45 years and above.

According to a study conducted in Japan, which was a first national survey done on tooth extractions revealed 85% caries and its sequelae related extractions and periodontal disease. Since extractions done as a consequence of caries or fractures is common among the population aged 15 years and above, preventive measures for reducing caries including root carious lesions should be considered. Measures should be taken by the dentists worldwide to prevent tooth loss due to such preventable causes[19].

The most frequent victim of extraction is the lower third molar, followed closely by the upper third molar. Age wise, for children below 15 years of age, the most common reason for extractions was orthodontics related (80.8% of patients aged 5-14 years) whereas, between ages 15-24 third molar extraction due to other causes was prevalent[19]. Although according to our study conducted the most commonly extracted tooth was the lower first molar.

CONCLUSION

Caries and its sequel were the main reasons for tooth extraction in this study and were frequently associated with pulpitis and crown failure. Therefore, in order to reduce the rate of dental extractions in our population, efforts should focus on prevention and treatment of caries.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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