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STUDY OF TOOTH EXTRACTION PATTERNS AMONG CHILDREN ATTENDING AL-FORAT HEALTH CENTER IN BABIL PROVINCE/IRAQ

***Dr. Layla Fadhil Azeez Al-Beidhani**

M. B. Ch. B, M.A., College of Dentistry University of Baghdad - 1997, Medical School in Mansoura, Egypt-2017
Babil Health Department, Al Forat Health Center, Al Musayyib Sector.

***Corresponding Author: Dr. Layla Fadhil Azeez Al-Beidhani**
M. B. Ch. B, M.A., College of Dentistry University of Baghdad - 1997, Medical School in Mansoura, Egypt-2017 Babil Health Department, Al Forat Health Center, Al Musayyib Sector.

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ABSTRACT

Background: To identify the causes of tooth extraction in a Euphrates Health Center **Method:** Data was collected prospectively from 400 children attending Euphrates Health Center the demographic profile, the indications for tooth extraction and the tooth extracted were noted. **Results:** The prevalence of tooth extraction was 59% in the study population. This occurred in significantly more male patients. Tooth loss was commonest amongst the 7-10 age group. Dental caries was the main cause of tooth loss for all age groups. Most patients (65%) lost a single tooth. The lower molars were the most frequently lost teeth (46%). Indications for tooth extraction were similar in the region. **Conclusion:** Dental caries remains the most common cause of tooth extraction. The indications for tooth extraction remain the same but the prevalence of tooth loss per cause of tooth loss had not changed over the last 21 years, and across institutions in Euphrates Health Center**.**

KEYWORDS: tooth, extraction, children.

INTRODUCTION

Oral health is fundamental to general health and well-being. A healthy mouth enables an individual to speak, eat and socialize without experiencing active disease, discomfort or embarrassment.[1]

Dental caries in primary teeth is a preventable and reversible infectious disease process that when left untreated results in pain, bacteremia, high treatment costs, reduced growth and development, speech disorders and premature tooth loss with its sequelae of compromised chewing and harm to the permanent dentition.[2]

Dental caries is one of the most prevalent chronic childhood diseases worldwide and is a major problem both from a population health perspective and for individual families who have to deal with a young child suffering from toothache.[3] It is a multifactorial disease that starts with microbiological shifts within the complex biofilm (dental plaque). Caries is affected by the consumption of dietary sugars, salivary flow, exposure to fluoride and preventive behaviors.[4]

Many studies were conducted in Africa and detected a serious increase in the dental caries prevalence, where 90% of the lesions were found untreated. On the contrary, developed countries experienced a significant caries reduction over the last 20 years mainly due to the higher awareness, better orientation of the public about use of fluorides and behavior modification.[5]

Causes for extraction were recorded according to criteria gathered and modified by a group of researchers:[6,8] Periapical problems: Deep carious lesion, unrestorable tooth structure, periapical abscess and draining fistula (with the aid of X-ray), or pathological mobility. Retained root: Remnant root present of the untreated badly carious tooth. Orthodontic need: Teeth extraction to prevent or correct malalignment. Trauma: Extraction took place as a result of the traumatic cause. Retained primary tooth: No sign of primary tooth mobility, on X-ray there is no normal root resorption and the underlying permanent tooth reach 3/4 root formation. Shedding time: Keeping in mind the age of the child, if there is any mobility of the primary tooth associated with pain and/or discomfort during eating. Failure of pulp treatment: With the help of radiographical assessment, primary tooth with pulp treatment (pulpotomy or pulpectomy) and for the permanent tooth any root canal treatment associated with continuous pain fistula or periapical abscess. Supernumerary, impacted, natal and neonatal teeth. Other reasons: May include mobility due to periodontal disease, patient/parents' requests.Past studies show that the proportion of Nigerians attending dental hospitals and clinics for routine dental.

Most patients present as a result of dental pain. Multiple variables are known to affect patient's utilization of health services, including dental health services. These reasons range from perception of dental treatment needs (Tickle and Worthington, 1997), and availability of interventions that meets those needs. Even where dental services are available,[9] multiple factors continue to impact on utilisation of these services. These factors range from patient's age, 8, 9 oral health needs and dental anxiety,[10] socioeconomic factors, and the family structure. One of the objectives of providing oral health care services is to help patients retain healthy, natural, functional teeth. In Euphrates Health Center, prevalence of tooth loss of both the primary and permanent dentition is high compared with figures from developed countries.

The causes of tooth loss for Euphrates Health Center children include dental caries and its sequelae such as dental abscess, failed restoration and retained roots. Other identified causes of tooth loss include trauma, which may be caused by road traffic accidents, domestic falls, contact sports and games,[11,12,13,14,15] periodontal disease, with periodontal disease being the least common in children,[11] and for orthodontic reasons. Folayan *et al*[16] however showed a shift in cause of tooth loss in their center – from caries related reasons to orthodontic reasons; and a decrease in the prevalence of tooth loss from caries. They alluded to a change resulting from increasing orthodontic needs; and a decline in need for dental extractions from caries due to availability of restorative materials and tools, and increasing availability of competent manpower including specialists.

This study assesses the cause of tooth loss in Euphrates Health Center. It reviews the changes in pattern of tooth loss in the centre over a 21 year period; and compares this to changes observed in two other dental centers in the same region in Babil.

METHOD

All healthy children seen at the out patient clinic of the department of Child Dental Health of Ibn Saif Hospital over a period of eighteen months were recruited into the study. Any child with a medical history of chronic health disorders were excluded from the study. Also, patients presenting with exfoliated tooth without the need for extraction were also excluded from the sample.

The minimum sample size was determined using standard statistical calculation. The prevalence for tooth loss was 31.94%, confidence interval of 1.96 and a 5% degree of accuracy. The minimum sample size required for the study was 334. This was rounded up to 400. Demographic data was recorded for each patient namely name, age, gender, address, parent's occupation and educational status. Routine dental clerking and subsequently, oral examination of all the subjects were carried out using sterile dental mouth mirror, dental probe and tweezers. Necessary investigations such as periapical radiographs, clinical pictures and study models were carried out to aid diagnosis and case management. For children who required extraction, the indications for extraction were noted. Records were also taken for number of teeth extracted for each patient during the study period.

The Data entry validation and analysis was done using SPSS statistical soft ware, measures of location and dispersions were computed for variables while frequency distributions and tabulations were used for categorical variables.

Associations and differences were considered significant when p value is equal to or less than 0.05 using the chi square test. The Fisher's exact test was used where Chi square test was invalid.

Ethical approval was obtained from the special clinic prior to study conduct. Verbal consent was also obtained from the parents or guardians prior to inclusion in the study.

RESULTS

The age range of children seen in this study was 3 to 15 years. The population consisted of 59.2% females. The prevalence of tooth extraction was 58.8%. This occurred in 235 children. Significantly more male patients had tooth extracted. The difference was statistically significant. See Table 1.

There were three age groups identified. Seventy-nine (33.6%) were 3–6 years old, 97(41.3%) were 7–10 years old, and 59 (25.1%) were 11–15 years old. Tooth loss was commonest amongst the 7–10 age group There was significant differences in the gender distribution of tooth extraction by age group ($p = 0.01$): More females lost tooth in the 3–6 age groups while more males lost tooth in the other age categories. See Table 2.

Dental caries was the most frequent reason for tooth extraction for all age groups. One hundred and seven (45.5%) children lost teeth due to dental caries, 40 (17%) due to dental abscess, while domestic fall and contact sport accounted for tooth extraction in 21 (8.9%) and 3 (1.3%) children respectively. Retained primary teeth was a second leading cause of teeth extraction in children aged 7–15. See Table 3.

Most patients (66.0%) lost a single tooth. Two teeth were lost by 44 children (18.7%) while 2.7% (18 children) lost 3 teeth. More teeth were lost in the mandible in both the primary ($p=0.005$) and permanent dentition. The lower molar teeth were the ones most frequently lost (47%). There was no loss of the upper lateral and the second premolar. See Tables 4, 5 and 6.

Table 1: Distribution of children with/without tooth extraction by gender.

	Male (%)	Female (%)	Total (%)
Tooth loss	121 (30.3)	114 (28.5)	235 (58.8)
No tooth loss	42 (10.5)	123 (30.8)	165 (41.2)
Total	163 (40.7)	237 (59.3)	400 (100)

Table 2: Distribution of children That Had Tooth extracted By Age Group and Gender.

Age Group	Male (%)	Female (%)	Total (%)
3 – 6	31 (13.2)	48 (20.4)	79 (33.6)
7 – 10	52 (22.1)	45 (19.1)	97 (41.3)
11 – 15	38 (16.2)	21 (8.9)	59 (25.1)
Total	121 (51.5)	114 (48.5)	235 (100)

X2 = 8.86; P = 0.01

Table 3: Distribution of Children by Reason of tooth extraction and Age Group.

Causes	Age group in years			Total	%
	3–6	7–10	11–15		
Abscess due to caries	19	15	6	40	17.0
Caries	29	46	32	107	45.5
Crowding/					
Space management	-	10	2	12	5.1
Domestic fall	13	4	4	21	8.9
Odontome	-	-	1	1	0.4
Periodontal disease	-		3	3	1.3
Retained teeth	14	22	10	46	19.6
Sports	3	-	-	3	1.3
Supernumerary	1	-	1	2	0.9
Total	79	97	59	235	100

Table 4: Distribution of Children By Number of Tooth extracted.

No of Teeth	Frequency	Percent	Total no of teeth
1	155	66.0	155
2	44	18.7	88
3	18	7.7	54
4 and above	18	7.7	83
Total	235	100	380

Table 5: Frequency of distribution Primary Tooth extraction according to type and dental arch.

Type of Teeth	A	B	C	D	E	Total
Maxillae	36	14	17	20	30	117 (37.3)
Mandible	43	21	11	60	62	197 (62.7)
Total	79	35	28	80	92	314 (100)

Table 6: Frequency of distribution Permanent Tooth extraction according to type and dental arch.

Type of Teeth	1	2	3	4	5	6	7	Total
Maxillae	4	-	2	8	-	5	2	21
Mandible	-	-	2	5	7	31	-	45
Total	4	-	4	13	7	36	2	66

DISCUSSION

More males had to undertake tooth extraction during the study period; a contrast to what was observed by Kekere-Ekun and Adenubi.[17] The result of this study however correlates with observations made in more recent studies in Euphrates Health Center[12,13,14,16] The reason for this observation can however, not be readily adduced.

Just like other reports from.[16,17] there were more primary teeth lost in this study sample. This observation

is not at variance with observations in other parts of the world.

More teeth were lost in the mandible in both dentitions just as observed in previous studies.[12,16,17] This may be due to the fact that mandibular teeth erupt ahead of their maxillary counterparts. Gravity effects also make food debris settle more on mandibular teeth. In addition, the grooves and fissures are more pronounced in mandibular teeth thereby acting as retaining areas for food debris.

The molars were the most commonly lost tooth. The first permanent molar has been recognized as being the most caries prone tooth in the permanent dentition probably as a result of its long exposure to the oral environment. This however differed from observation by Folayan *et al*[16] who recorded more loss of anterior teeth compared to molars. An interesting trend seen in present study similar to observations reported by Folayan *et al*[16] and Denloye *et al*[11] is the increasing prevalence of primary incisors extracted due to retention.

The causes of tooth extraction remain the same in all the Euphrates Health Center and Ibn Saif Hospital caries and its sequelea, closely followed by retained primary teeth.[16] This is similar to reports from other studies in Africa[18] and other global studies conducted in children and adults.[19] However, there appears to be a decrease in the prevalence of tooth loss due to caries and its sequelae in each of these dental centers just as observed in other countries.

Multiple reasons could be alluded too for these observed decreases. This includes increase in availability of peadiatric specialist resulting in better management of these lesions, and the possibility of increased awareness and early reporting to the clinic. It is less likely that the reason is the second as past studies have continued to point to low utilization of dental services and delayed reporting for dental management of caries in the region.

This delay in reporting possibly accounts for the continued high prevalence of teeth extraction observed in all these centers. The study apparently shows that prevalence of tooth loss due to tooth extraction is still high and much higher than what obtains in other parts of the world.

CONCLUSIONS

The prevalence of tooth extraction was 59% in this study population. Caries and its sequelea were the main reasons for tooth extraction with more tooth extraction amongst boys, in the 7-10-year-old age group, in the primary dentition, and in the mandible. Molars were the most common type of teeth extracted. The prevalence of tooth extraction from caries and its sequelea reduced over the last 21 years in the study centre (92.2% vs 62.5%) though still much higher than what obtains currently in Euphrates Health Center. The high prevalence of tooth extraction in the region appears to be be due to late presentation rather than poor management strategies. This observation therefore should constitute a public health concern for the region.

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