

Original Articles

PATTERN OF TOOTH LOSS IN A SELECTED POPULATION AT KING SAUD UNIVERSITY COLLEGE OF DENTISTRY*

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تم استقصاء نموذج فقد الأسنان في جزء مختار من السكان السعوديين . شملت الدراسة (١١٧٣) مريض سعودي تراوحت أعمارهم بين ١٥ - ٨٥ عاماً راجعوا عيادات الفحص السني في كلية طب الأسنان جامعة الملك سعود في الرياض بين عام ١٩٩٠م وعام ١٩٩٢م . وقد وجد أن فقد الأسنان يزداد بصورة ثابتة مع ازدياد العمر . وقد كان هناك ازدياد قليلاً في فقد الأسنان بين الإناث منه في الذكور . الأرحاء الأولى السفلية كانت أكثر الأسنان فقداً (وتشكل ٤١,٥٪ من مجموع فقد الأسنان) في حين الأنياب السفلية كانت أطولها بقاءً (وتشكل ٩,١٪ من مجموع فقد الأسنان) الأسنان الأمامية يغلب فقدها في الفك العلوي عنه في الفك السفلي في حين الأرحاء يكون فقدها بطريقة معكوسة لما سبق . وكان هناك زيادة سريعة وواضحة في فقدان الأسنان بعد عمر ٣٥ - ٤٥ عاماً .

The pattern of tooth loss was investigated in a selected segment of Saudi population. The study covered 1, 173 Saudi patients, aged 15-85 years, who attended the dental screening clinics of the College of Dentistry, King Saud University in Riyadh between 1990-1992. Tooth loss was found to increase steadily with age. There was a slight tendency for higher tooth mortality among the females. The mandibular first molars were the most frequently missing (accounting for 41.5% of the total missing teeth), while the mandibular canines were the longest retained (accounting for 9.1 % of the total missing teeth). The anterior teeth were more often missing in the maxillary than in the mandibular, while the molars were more often missing in the reverse order. There was an abrupt increase in tooth mortality after the ages 35-44.

Introduction

The pattern of tooth loss has been generally regarded as one of the most important measures for assessing the standard, availability and utilization of both curative and preventive dental care in a given population.¹²

Most national surveys on patterns of tooth loss have found a linear relationship between increase

in age and loss of teeth. However, there are still great regional differences in the prevalence of toothlessness in the world.^{13,12}

The two most important biological factors responsible for tooth loss are dental caries (which accounts for most teeth lost in early life) and periodontal disease (which accounts for most teeth loss in later life). In the last three decades, most efforts of the dental profession in the industrialized nations have been directed towards the treatment and prevention of these diseases. As a result, a dramatic decline in edentulousness with age has now been documented.^{13,14}

Little, if any, is known about the patterns of tooth loss in any segment of the Saudi population. The purpose of this study was, therefore, to investigate the patterns of tooth loss in a selected adult Saudi population.

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Materials and Methods

The study involved 1,173 Saudi patients, age 15-85 years, who attended the dental screening clinics at the College of Dentistry, King Saud University, Riyadh between 1990-1992. The sample was obtained by random selection of patient files from records stored in serial order. The clinical examinations and radiographs, taken after the first visit to the dental clinics, were used as the source of information on age, sex, teeth present and missing. The number of teeth present and missing were recorded from full mouth periapical radiographs and orthopantomograms. As in other studies, third molars were excluded from this study on account of their frequent impaction tendencies or agenesis. Retained roots and impacted teeth were considered as non-existing teeth.

The relationship between missing teeth and age was assessed by correlation analysis. Inter-arch and sex differences in tooth mortality were discerned by f-test.

Results

Table 1 shows the distribution of patients in each age group. A fairly constant direct relationship ($r = 0.69$) was found between increase in age and mean number of missing individual teeth in both sexes [Fig.1] and was statistically significant ($P < 0.0001$). The mandibular first molars were found to be the most frequently missing at 41.5%, while the mandibular canines were found to be the longest retained teeth at 41.5% and at 9.1% of the total missing teeth [Fig.2]. In the region from the central incisors to the first premolars, there was a tendency for more maxillary teeth to be missing

Table 1. Age and sex distribution of the sample.

Age-Group	Male	Female	Total
15-24	121	177	298
25-34	101	139	240
35-44	65	158	223
45-54	79	138	217
55-64	79	58	137
65-74	28	15	43
>74	14	1	15
	487	686	1173

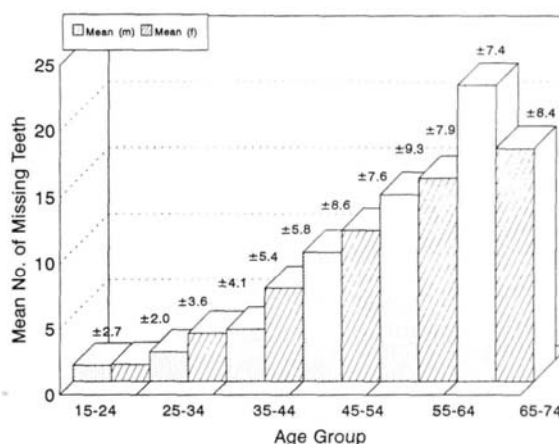


Figure 1. Mean number of missing teeth by age-group and gender.

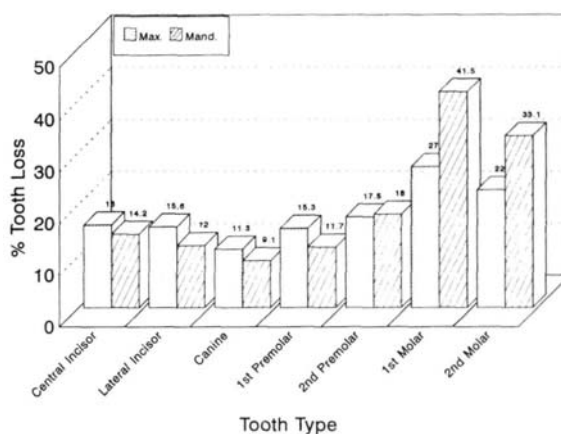


Figure 2. Percentage tooth loss by tooth type.

than the mandibular teeth and the trend reverses from the second premolar teeth [Fig.2]. The inter-arch differences have been found to be statistically significant ($P < 0.0001$).

Loss of Individual Anterior Teeth, [Figs. 3-5]

There was a low tooth mortality rate of anterior teeth (centrals, laterals and canines) among younger age-groups (from 15-24 to 35-44). However, from 35-44-year age-group to > 74 year-olds, the tooth mortality rate rose sharply with the female anterior teeth more often retained. The sex differences were statistically significant ($P < 0.0001$).

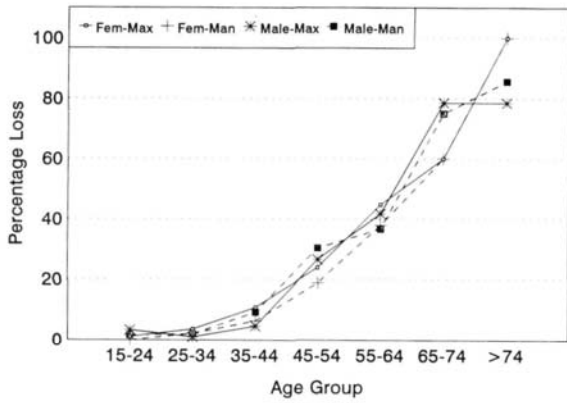


Figure 3. Percentage loss of central incisors by arch and age-group for both sexes.

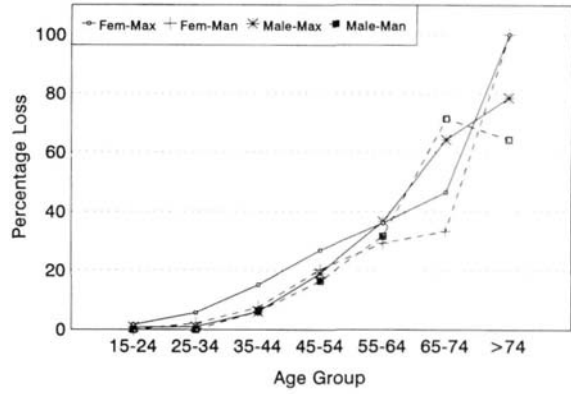


Figure 6. Percentage loss of premolars by arch and age-group for both sexes.

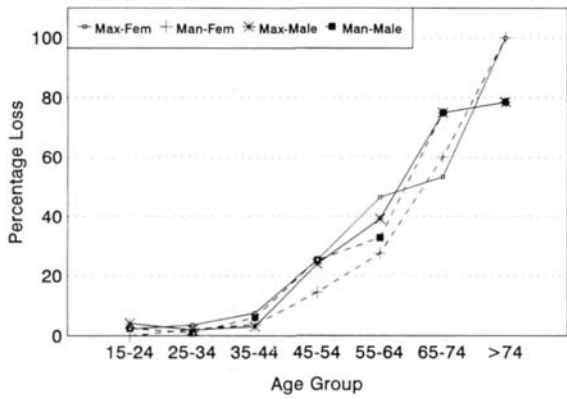


Figure 4. Percentage loss of lateral incisors by arch and age-group for both sexes.

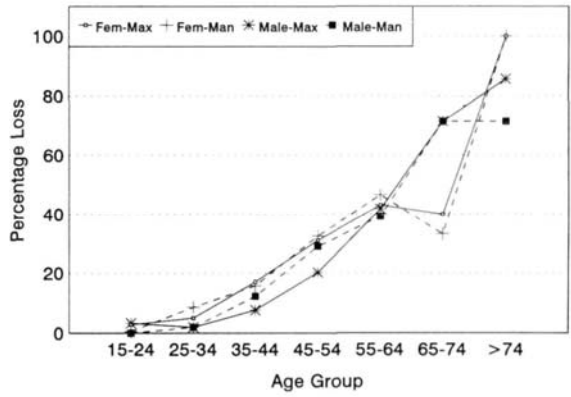


Figure 7. Percentage loss of 2nd premolars by arch and age-group for both sexes.

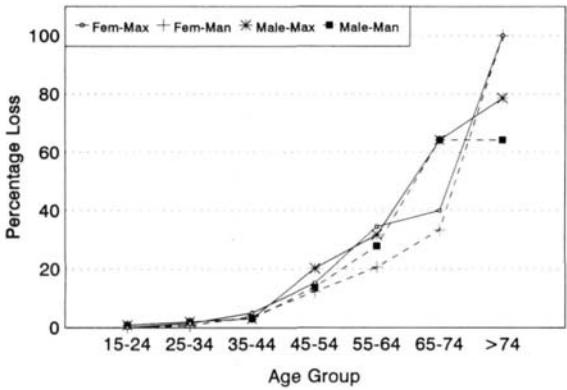


Figure 5. Percentage loss of canines by arch and age-group for both sexes.

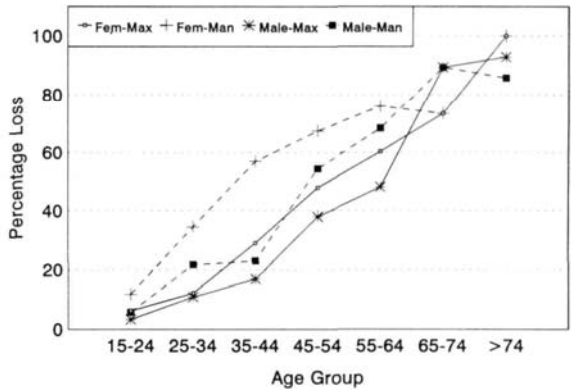


Figure 8. Percentage loss of 1st molars by arch and age for both sexes.

Loss of Individual Posterior Teeth, [Figs. 6-9]

No significant sex differences were found in tooth mortality rate among the first and second premolars.

The female mandibular first and second molars were the most often missing, while the male maxillary first and second molars were the longest retained within individual tooth types. This sex

Table 2. Age and sex specific percentage of persons with no missing teeth, 15 missing teeth and over 15 missing teeth.

Age-Group	MALE			FEMALE		
	No Missing Teeth (%)	< 15 Missing Teeth (%)	> 15 Missing Teeth (%)	No Missing Teeth (%)	< 15 Missing Teeth (%)	> 15 Missing Teeth (%)
15-24	55.37	43.60	0.83	54.80	45.19	0.00
25-34	33.66	64.36	1.98	24.46	74.11	1.44
35-44	24.62	69.23	6.16	9.49	82.28	8.23
45-54	7.59	64.56	27.86	3.62	70.28	26.09
55-64	5.06	35.44	59.5	1.72	50.00	48.28
65-74	0.00	14.28	85.72	0.00	33.33	66.66
>74	0.00	21.43	78.57	0.00	66.66	100.00

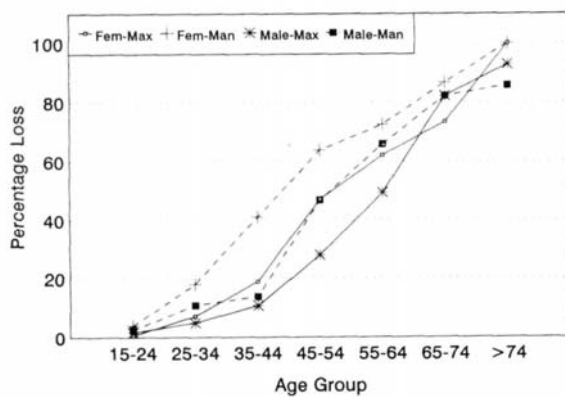


Figure 9. Percentage loss of 2nd molars by arch and age for both sexes.

differences were found to be statistically significant ($P < 0.0001$).

With increasing age, the percentage of people with more than 15 missing teeth increased from 0.81% at 15-24-year-old age-group to 78.6% in the > 74-year-old age-group and from 0% at 15-24-year-old age-group to 100% at > 74-year-old age-group in males and females, respectively. Abrupt increase in tooth mortality was noticeable after the ages of 35-44 in which males had 6.2% and females had 8.2% of more than 15 teeth missing (Table 2).

Discussion

This study provides a profile of tooth loss in a selected Saudi adult population. Generally, the direct relationship between the increase in age and the loss of teeth found in this study is consistent with the usually observed patterns of tooth loss.

The tendency for higher tooth loss in females than in males is consistent with some studies,^{1,4} but

not with others.^{7,15} The higher level of tooth mortality in women has been attributed in some countries to the more frequent dental visits by females for care of inadequate and unaesthetic dentition⁴ rather than to a true reflection of a higher tooth mortality than the male counterpart.

Not surprisingly, the first molar was found to be the most commonly missing while the canine was the longest retained. Early loss of molars relative to other teeth has been generally attributed to their early eruption and vulnerability to caries.^{12,16}

The low mortality rate of the anterior teeth, in the younger age-groups up to the fourth decade, is an indication that the need for aesthetic replacement of missing teeth will be uncommon among young adults. Although caries is still regarded as the leading cause of tooth loss, the loss of anterior teeth is attributed predominantly to periodontal disease while loss of posterior teeth is attributed predominantly to caries.^{2,5,17,19}

A notable finding of interarch difference in the pattern of tooth loss, which is consistent with other studies,^{7,12,15,20} was that anteriors and first premolars were more frequently missing in the maxillary than in the mandibular arch and molars were more frequently missing in the latter than in the former. Higher mortality of maxillary premolars compared to mandibular premolars is thought to be due to the relatively higher resistance of the mandibular premolars to dental caries.^{12,16}

The tendency for the molars to be more frequently missing coupled with the mandibular molars having higher tooth mortality than maxillary molars as demonstrated in this study may explain why mandibular distal extension partial dentures have been found to be the most common type of removable partial dentures.^{20,21}

Moreover, the likelihood of finding more females with mandibular distal extensions than males in this study is higher since they tend to have a higher mandibular molar tooth mortality.

The observation of an abrupt increase in tooth mortality levels after the 35-44-year-old age-group in the present study is in agreement with others¹²² and is consistent with the progress of periodontal disease that finally takes its toll on the dentition in the latter decades of life.^{23,24}

In the comparison of the mean numbers of missing teeth among different countries, the degree of tooth loss in this study was close to that observed in other populations in developing countries^{11,2,5,25} but certainly higher than that observed in the USA study.¹⁵ Recent studies have found a remarkable reduction in tooth mortality among populations in industrialized countries as a result of improved dental services in conjunction with an increased public awareness of matters relating to oral health.^{10-13,15} In contrast, an oral health survey of Saudi Arabia has shown that the incidence of caries increases with age along with a worsening of the periodontal status.²⁶ This finding therefore underscores the importance and supports the recommendation of introducing a more comprehensive preventive measures and improving oral health care among Saudi communities.²⁶ It is worth noting, however, that the data in this and other similar studies are cross-sectional and differences have to be interpreted with caution, as emphasis can only be placed on trends rather than the qualitative aspects.

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