Prevalence and severity of root caries in qat chewing in Yemen (Thamar)

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Abstract:

An epidemiological survey of root caries in 228 Yemenes individuals aged between 20 years to more than 60 revealed an age and gender adjusted over all root caries index (RCI) rate of 34% indicating that approximately one in three surfaces with gum recession exhibited root caries, age adjusted RCI rate were nearly the same figures for both male and female with no significant difference between them, but there was a statistically significant age difference. The study revealed that for severity of the root caries lesion, grade I (incipient) was mostly prevalent for both gender in the young age groups while, grade II, III and IV figures began to increase for both gender in older ages with significant difference , From this study, it my be concluded that root surface caries is a major problem in people not treated from periodontal diseases, and in order to provide specific preventive regimes and improved treatment for root surface lesion it is essential that data be collected and the prevalence and distribution of the disease is estimated.

Key words:

Root caries, qat chewing, RCI, adult Yemenes.

Introduction:

Root surface lesion have been the subject of increasing studies as more teeth are retained and subjected to stress and sequelae of chronic periodontal disease.

It has been reported that gingival recession occures in 78% to 100% of all middle aged individuals [1, 2], as gingival tissues recede, A more vulnerable surface of the tooth, the cementum becomes exposed to the oral environment, with time and under certain circumstances it can progress to what is named cemental caries, senile caries or root surface caries [3] , this type of caries has been cited as an increasing clinical problem that has become more significant[4,5,6] .

The aim of this present study is to determine the prevalence and severity of root caries in a group of individuals in Thamar (Yemen) in order to get some information on an important dental problem that is likely to become more significant in the future.

Materials and methods:

A random sample of 288 individuals who were attending to the College of Dentistry in Thamar Governorate for dental treatment were examined (170 males and 58 females) with an age range of (20-69) years.

As a general rule observed in the country females numbers are relatively low in comparison with males.

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Clinical examination was carried out by one examiner for all subjects using a dental chair unit, plane mouth mirrors and sickle shaped caries explorers, cavitations were recorded by surface using katz (1980)[7] root caries index, the formula of root caries index

$$\frac{(R-D)+(R-F)}{(R-D)+(R-F)+(R-N)}\times 100 = RCI$$

is defined as:-

(R–D) root surface with decay and recession.

(R–F) recession of gingiva with a filled surface.

(R–N) recession present with a normal or sound surface.

In general root fillings were not found in the examination for all the subjects in this study. The scoring for a single tooth depended upon the most severly affected surface to be recorded for that tooth [7].

Further classification of decayed surface was recorded according to Billings (1985) severity index [8] as follows: -

Grade (1): is characterized by an incipient lesion the surface is soft and irregular and can be penetrated with a dental explore.

Grade (2): is characterized by a shallow lesion, the surface texture is soft, irregular rough and can be penetrated with a dental explorer, there is a surface defect less than 0.5 mm in depth.

Grade (3): is characterized by the cavitation of surface texture, there is a penetrating lesion and cavitation is present greater than 0.5 mm in depth but no pulpal involvement.

Grade (4): is characterized by pulpal involvement there is a deeply penetrating lesion, pulpal or root canal involvement.

The statistical analysis of the data included the mean and standard deviation, F test and Chi square test were used to determine the significant differences in age and gender when indicated.

Results:

The age and gender distribution of 228 study participants is presented in table (1). The proportion of males (74.6%) was much higher than that of females (25.4%).

Table (1): Distribution of sample by age and gender.

Age / years	Males		Females		Total	
	No.	%	No.	%	No.	%
20-29	55	74.3	19	25.7	74	32.5
30–39	29	59.2	20	40.8	49	21.5
40–49	33	80.5	8	19.5	41	18
50–59	34	82.9	7	17.1	41	18
60-69	19	82.6	4	17.4	23	10
Total.	170	74.6	58	25.4	288	100

Table (2) shows the mean RCI for the total sample was 34%. There was a highly statistically significant difference in root caries index with age $P<0.001$, (it began with 27.9% in age groups up to 29 years and increased till 36.3% in individuals between 40-59 years and than decreased to 30.8% in individuals over 60 years of age).

No significant difference in mean RCI was found between males and females in the different age groups and the total sample.

Table (2): Age specific mean RCI rates and standard deviation by gender.

Age / years	Males			Females			Total	F test between RCI % of males and females		
	*	**	RCI(%)±SD	*	**	RCI(%)±SD	RCI(%)±SD	F value	p	***
20-29	74	33	30±15.7	65	21	24.4 ± 17.5	27.9 ± 26.3	0.330	< 0.32	N.S
30-39	244	112	31.4±15.2	115	64	35.7 ± 16.3	32.8 ± 28.2	0.933	< 0.41	N.S
40-49	411	234	36.2±17.8	95	55	36.6 ± 16.5	36.3 ± 30.1	0.061	< 0.89	N.S
50-59	469	269	36.7±20.4	111	64	36.5 ± 17.5	36.4 ± 27.6	0.027	< 0.71	N.S
60-69	420	182	30.2±15.4	73	38	34.2 ± 15.3	30.8 ± 26.2	0.475	< 0.23	N.S
Total	1618	830	33.9 ±16.2	459	242	34 ± 15.2	34 ± 33.3	0.255	< 0.91	N.S

Age x^2 = 90.548 d.f. = 35 p< 0.001 highly significant
Gender. No significant difference in mean RCI of males and females
* Surfaces with gingival recession
**Surfaces with Decay
***Significance

The severity of root caries is shown in table (3), grade I (incipient) had the greatest percentage irrespective of the age group and gender with a range of (38.9-81.6)% followed orderly by grade II (shallow lesion) with a range of (18.4-38.5)%, than grade III (cavitation) (0-19)% and finally grade IV (cavitation with pulp or root canal involvement with a range of (0-5.3)%.

For the different grades of severity there was a statistically significant difference in the severity of root caries between males and females (Grade I was more in females, while Grade II, III and IV were more in males).

Table (3): Number and percentage of the sample according to severity of root caries by age groups

Age / years	Males								Females							
	Grade I		Grade II		Grade III		Grade IV		Grade I		Grade II		Grade III		Grade IV	
	No	%	No.	%	No	%	No	%	No	%	No.	%	No	%	No	%
20-29	15	78.9	4	21.1	–	–	–	–	13	61.9	7	33.3	1	4.8	–	–
30-39	70	16.9	27	23.9	14	12.4	2	1.8	49	81.6	11	18.4	–	–	–	–
40-49	88	38.9	87	38.5	39	17.3	12	5.3	27	48.2	21	37.5	7	12.5	1	1.8
50-59	127	47.4	80	29.9	51	19	10	3.7	44	66.6	17	25.8	5	7.6	–	–
60-69	71	39.7	67	37.4	33	18.4	8	4.5	24	63.2	9	23.7	4	10.5	1	2.6
Total	37	51	265	30.6	137	15.8	32	2.6	157	65.1	65	27	17	7.1	2	0.8

Grade I X^2 between males and females = 15.567 d.f =5 Sig. at 0.05 level.
Grade II X^2 between males and females =18.740 d.f =5 Sig. at 0.05 level.
Grade III X^2 between males and females =13.187 d.f =5 Sig. at 0.05 level.
Grade IV X^2 between males and females =17.944 d.f =5 Sig. at 0.05 level.

Discussion:

Caries on the root surface has become a more frequently observed condition and the prevalence will most likely increase with the lengthening life span of the population and increasing effectiveness of preventive methods against coronal caries.

Different methods were used to describe the root caries and some studies took elderly age groups while others took other age groups, so comparison of the findings of this study will be difficult to cross match them, because of using various methods for detection of root caries (count of root caries lesion per tooth, per person or number of root caries lesion of teeth present and others)[10]

In general the mean RCI figures obtained in this study are much higher than that reported in Mosul[11] which may be attributed to excessive gingival recession present in Thamar population, due to difference in tooth brushing habits[12] poor oral hygienes[13] , use of other methods for cleaning teeth like sewak which is very much popular in Yemen compared to Iraq[14] , in addition to excessive chewing of Qat for both gender that causes sever gingival recession[15] .Maximum RCI was found in individuals aged between 50-59 years which is contrast to the findings of AL-Sayigh that found maximum RCI figures was found in age group 30-39 years.RCI figures appeared to increase with age with a highly statistically significant age difference $p < 0.001$, except for the last age group (both males and females) where there was a decline which may be attributed to the reason of having more teeth being extracted at this age because of ageing [9]

There was no statistically significant difference between RCI figures for the males and females in the sample.

The finding of the present study relating to caries severity shown in Table(3) revealed that according to Billings et al classification 1985, that for both gender, grade I (incipient) reported the highest percentage followed by grade II, then III and finally IV (pulpal involvement) reported the least percentage for both gender, this finding disagrees with the results obtained in other studies that found grade III to be more prevalent than other grades [9,11] .Females tended to have more grade I compared to males, while grade II, III and IV were more in males than female with a statistically significant difference between them.

As the individuals became older grades II, III and IV increased with age in both gender which may be attributed to the irreversibility of root caries and it's progressiveness.

OF all the individuals examined no one was found to have a filled root surface in comparison with the high number of surface with a root decay, this contradicts the findings of many studies carried out in developed countries that showed a large number of root fillings [16,17,18] the high need of restorative treatment for these adults reflect the limited dental awareness regarding the importance of dental health and limited utilization of dental services.Most of the population were with poor oral hygiene and this according to other studies had a significant relation with root surface caries [19,20,21] this may be due to plaque accumulation which lead to periodontal disease and gingival recession and then lead to exposure of the root surface to the oral environment.In this study it may be concluded that root surface caries is a major problem in individuals not treated from periodontal disease and in people who have poor oral hygiene, A method of trying to treat this kind of caries by restorative material [22] with the poor retention rate of root restorations makes preventive measures mandatory. Although fluorides are considered the first line of defense against root caries [24,25] , it alone is not effective

but must be accompanied by health educational programmes that must be oriented to persuade Yemenes individuals to be involved in proper oral hygiene measures to try to stabilize existing periodontal disease by minimizing where ever feasible the tendency for further gingival recession in patients of all ages [26], and also to decrease chewing of Qat in order to obtain better oral hygiene [13,15].

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