

## Association between root surface caries occurrence and systemic diseases in adult and elderly population in Mosul City – Iraq

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### ABSTRACT

This study was designed to investigate the relationship between root surface caries and systemic disease (diabetes, hypertension and heart problem) in the adult and elderly population in Mosul City, Iraq.

A sample of (1270) subjects [719 males (56.6%) and 551 (43.4%)] are collected randomly from different eight factories, seven primary schools, eight secondary schools and five colleges from Mosul City. According to age, the sample was divided into four age groups (30-39), (40-49), (50-59) and (60-69) years.

The result indicated that the subjects with systemic disease have more effected by root surface caries than the subject medically fit, for the age groups below (60) years. These differences were highly significant, while the subjects in the age group (60-69) years reported the very high percentage affected by root surface caries for both groups with no significant difference between them. The study revealed that the males with systemic disease have a higher significant root surface caries than the females in all age groups except for the age group (40-49) years. For total group with root surface caries, the percent with systemic disease in males was slightly higher (36.8%) than females (29.8%) with no significant difference between them.

**Key Words:** Root caries, systemic disease, elderly, adults.

### الخلاصة

صُمِّمَت هذه الدراسة لمعرفة العلاقة بين تسوس جذور الأسنان مع الأشخاص المصابين بأمراض جهازية (السكري وارتفاع الضغط وأمراض القلب) عند الأشخاص البالغين والمسنين في مدينة الموصل، العراق. شملت الدراسة (1270) شخص حيث كان عدد الذكور [ 719 (60.6%) ] وعدد الإناث 551 (43.4%) وتم جمع العينة عشوائياً من ثمانية معامل وسبعة مدارس ابتدائية وثمانية مدارس إعدادية وخمسة كليات في مدينة الموصل. قُسمت العينة في الدراسة إلى أربع مجاميع اعتماداً على العمر (30-39) و(40-49) و(50-59) و(60-69) سنة.

أظهرت النتائج أن الأشخاص المصابين بأمراض جهازية أكثر إصابة بتسوس جذور الأسنان من الأشخاص السليمين، تحت عمر (60) سنة كان هذا الاختلاف معنوياً بدلالة احصائية بينما في الفئة العمرية (60-69) سنة سُجِّلت نسبة عالية جداً من الأشخاص المصابين بتسوس جذور الأسنان للأشخاص السليمين والمصابين بأمراض جهازية وبدون دلالة معنوية بينهما.

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أما لمختلف الفئات العمرية فقد أظهرت النتائج أن الذكور من المصابين بأمراض جهازية لديهم تسوس جذور الأسنان أكثر من الإناث في جميع الفئات العمرية ما عدا الفئة العمرية (٤٠-٤٩) سنة وبدلالة احصائية. أما لمجموع العينة فقد أظهرت النتائج أن المصابين بتسوس جذور الأسنان كانت نسبة اصابتهم للذكور (٣٦,٨%) أعلى من الإناث (٢٩,٨%) وبدون دلالة معنوية بينهما.

## INTRODUCTION

Longer life expectancy in humans has given rise to concern regarding the state of oral health in older adults. One of the oral health problems related to increasing age is root surface caries (RSC) people of advanced age also commonly affected by one or more chronic medical condition, resulting in decreased salivary quantity and altered salivary character due to disease or medications <sup>(1,2)</sup>, also chronic disease can contribute to diminished oral hygiene due to impaired visual acuity and /or manual dexterity <sup>(3)</sup> all these factors contribute on root surface caries etiology.

The dry mouth found an elderly patient cannot be attributed entirely to normal physiological aging <sup>(4,5)</sup> for example patients with diabetes may have a dry mouth that can contribute to both periodontal disease and root surface caries. In other patients diuretics prescribed for the treatment of hypertension have significant xerostomic side effect.

So the purpose of this study was to investigate the relationship between root surface caries and systemic disease (diabetes, hypertension and heart problem) in the adult population age (30-70) year in Mosul City – Iraq.

## MATERIALS AND METHODS

A random sample of (1270) subjects from the city of Mosul. The sample selected randomly from eight different factories, eight Secondary schools and five colleges from the University of Mosul.

The examination of the root surface caries (RSC) was carried out using plane mouth mirror and sickle-shaped explorer. All subjects were examined while seated in a side chair, the examination was carried out in a suitable room under natural daylight.

The criteria described by Banting *et al.* <sup>(6)</sup> for identification of root caries. Additional data were collected about the subjects' age, sex and medical status (the subjects considered with systemic disease those subject who have hypertension, diabetes and heart problem).

The statistical analysis of data was carried out using Chi-square test ( $\chi^2$ ) to determine significant difference between subjects with and without root surface caries in medically fit and subjects with systemic disease. The differences were considered significant when the probability ( $p$ ) level equal to or less than (0.05) ( $p < 0.05$ )

## RESULTS

Distribution of the sample by age and gender are shown in table (1). The sample consists of (1270) subjects, (719) males (56.6%) and (551) females (43.41%). The sample is divided into four age groups, namely, (30-39), (40-49), (50-59) and (60-69) years.

Table (1): Distribution of the study sample according to age and gender

Age Group (Years)	Male		Female		Both	
	No.	%	No.	%	No.	%
30 - 39	141	36.43	246	63.57	387	100
40 - 49	233	53.56	202	40.44	435	100
50 - 59	245	72.70	92	27.30	337	100
60 - 69	100	90.09	11	9.91	111	100
Total	719	56.60	551	43.40	1270	100

Table (2) demonstrate the number and percentage of subjects with and without root surface caries who are medically fit and those who complain from any systemic disease (as hypertension, diabetes and heart problem) according to the groups. The result indicated that the subjects with systemic disease have more effected by root surface caries than the subject medically fit, the age groups below (60) years these differences were highly significant. While the subject in the age group (60-69) years reported the very high percentage affected by (RSC) for both groups with no significant differences between them.

Table (2): Number and percent of subject with and without RSC in relation to the systemic disease according to the age

Age Group	Health Status	With RSC		Without RSC		$\chi^2$ Test	p
		No.	%	No.	%		
30-39	Medically Fit with Systemic Disease	121	34.1	233	65.9	36.04	<0.001
		26	78.8	7	21.2		
40-49	Medically Fit with Systemic Disease	123	32.5	255	67.4	38.48	<0.001
		44	77.2	13	22.8		
50-59	Medically Fit with Systemic Disease	87	36.1	154	63.9	30.71	<0.001
		73	76	23	24		
60-69	Medically Fit with Systemic Disease	48	94.1	3	5.9	0.169	<0.005
		55	91.6	5	8.4		

Table (3) display the number and percentage of the subjects with root surfaced caries in subject with systemic disease and medically fit according to gender.

The study reported that males with systemic disease have higher significant (RSC) than the females in all age group except for the age group (40-49) year there was no significant differences between the males and females.

Table (3): Number and percent of subject with and without RSC in relation to the systemic disease according to the age and sex

Age Group	Health Status	Males		Females		X <sup>2</sup> test	P
		No	%	No	%		
30-39	Medically Fit with Systemic Disease	37	70.5	84	69.5	13.923	<0.001
		15	57.7	11	42.3		
40-49	Medically Fit with Systemic Disease	75	61	48	39	0.619	>0.05
		24	54.5	20	45.5		
50-59	Medically Fit with Systemic Disease	76	87.3	11	12.7	8.938	<0.01
		5	68.8	23	31.2		
60-69	Medically Fit with Systemic Disease	47	97.9	1	2.1	12.138	<0.001
		48	87.2	7	12.8		

For the total groups with (RSC) the percent with systemic disease in males was slight higher (36.8%) than females (29.8%) with no significant differences between them (table 4).

Table (4): Number and percent of subjects with and without RSC in relation to the systemic disease according to the sex

Health Status	Males		Females	
	No.	%	No.	%
Medically Fit	235	63.2	144	70.2
With Systemic Disease	137	36.8	61	29.8

$\chi^2 = 2.932$       d.f=1       $p > 0.05$

## DISCUSSION

A root caries lesion is initiated on root surface exposed to the oral environment, such exposures is therefore, a pre-requisite for this type of decay exposure may occur as a result of periodontal disease<sup>(7,8)</sup> or periodontal treatment<sup>(9,10)</sup>. There are much information is available concerning the potential effects of systemic conditions and diseases on the periodontium. It is well known that systemic conditions may effect the onset progression and treatment of diseases.

The findings of the study revealed that subjects with systemic disease reported very high percentage with (RSC) a bout (76%-78.8%) while (22.8%-24%) without (RSC), for subjects age group under (60%), it was contrast with medically fit subject reported high percentage of subjects with out (RSC).

These difference were very high statistically significant ( $p < 0.001$ ) while in the elderly group age group (60-69) year reported high prevalence of subjects with (RSC) in both groups (medically fit and with systemic disease) with no significant difference between them.

These findings are in agreement with findings reported by other studies<sup>(11,12)</sup>. The increase of (RSC) with age especially elderly person is in agreement with findings reported by others<sup>(7,13)</sup>.

The study reveals that males more effect by (RSC) than females over the (40) years and it was high significant over the (50) year, also the males with systemic disease reported more effected by (RSC) than females in all age groups.

This confirms the findings of other studies<sup>(14,15,16)</sup> while for the total sample reported no significant differences between males and females in both subjects medically fit and subjects with systemic disease.

In general, the study showed that males display higher rates of (RSC) experience than females. It is possible that his observation is related to the number of nature teeth remaining<sup>(16)</sup>, the oral hygiene and the extent of periodontal disease<sup>(16,17)</sup> which also has been shown to vary between the sexes in addition to that the females are more concerned with their teeth than males.

Both elderly subjects medically fit and with systemic disease may negatively influence the oral environment. A devastating intraoral condition contributing to root surface caries is the xerostomic or dry mouth<sup>(11)</sup>.

Chronic systemic disease and their management with medication results in wide spread alteration of salivary quantity and quality in the elderly<sup>(1,2)</sup> predisposing them to compromised antimicrobial protection and a tendency for lower intraoral pH<sup>(18)</sup>. Disability and dependency that increase in old age impair the removal of plaque and food debris.

Saliva is extremely important as a protective agent against carries because of its ability to buffer and dilute intraoral acid and to assist removal of food debris and microorganisms from tooth surface. A deficiency of saliva reversal compromises an essential natural defense mechanism.

The dry mouth found in an elderly patient can be due to some systemic disease as in diabetes patient and not only attributed to normal physiological aging<sup>(4,5)</sup>. So those patient complain from dry mouth may contribute to both periodontal disease and root surface caries, in order patient diuretics prescribed for them to treatment of hypertension and tricyclic antidepressant used for sedation or for mood elevation have significant xerostomic side effects. In addition many elderly people take multiple-prescribed medications combined with the counter preparations, often lead to a situation in which a person may take six or more daily medications.

The side effects of these substances alone and the interaction between these preparations may cause dry mouth<sup>(11)</sup>.

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