Association between periodontal health status and acquired coronary heart disease

Nadia Al-Rawi ,B.D.S *
Athra M Al-Weheb, B.D.S, M.Sc**

Abstract:

The objective of this study was conducted to evaluated the periodontal health status of patients with acquired coronary heart disease (CHD) and compare it to control group . The study group consists of 200 patients with an age range (35-70) years, had coronary heart disease and compared to control group of non –coronary heart disease matching with age &sex. Periodontitis, loss of attachment &missing teeth were assessed using CPI (WHO (1997). Results showed highly significant differences between study &control groups in all degree of severity diseased periodontal conditions ($p<0.001$).The percentage of patients with periodontal disease and loss of attachment in study group 68%, 58.5%respectively higher than control group 50.5%and 35%respectively. It was concluded that periodontal disease more common among patients with CHD than control. Thus the possibility of chronic oral infection or similar factor may be positively associated with CHD at least in patients susceptible to CHD.

Keywords:

Periodontal health, acquired coronary heart disease, loss of attachment, missing teeth.

Introduction:

Coronary heart disease is the leading cause of adult mortality and morbidity throughout the world [1] .Recent data suggest that chronic infection may play an important role in the development of atherosis, this concept arises from the fact that traditional factors for atherosclerosis and consequent coronary artery disease such as hypertension, hypercholesteremia, diabetes mellitus, and smoking do not account for all of the atherosclerosis found in a large proportion of the population [2].

One of the most common and often undiagnosed diseases of human is periodontitis, which is a chronic infection of the supporting tissues of the teeth.

In Iraqi study on 508 adult subjects aged 35-60 years, in Baghdad found 91.7% of the sample had signs of periodontal disease[3].

And in the year 2000 one of every 12.5 deaths in Iraq was caused by cardiovascular disease [4] .Patients with periodontal disease are an average twice the risk for coronary vascular disease [6,7].

The aim of this study was to investigate the possible association between periodontal health status and acquired coronary heart disease in susceptible people and compare them to a control group without coronary heart disease.

* Dentist, College of Dentistry, Baghdad University
** Assistant Professor in the Department of Pedodontics, Orthodontics and Preventive Dentistry, College of Dentistry, Baghdad University

Material and methods:

The sample: This study were conducted during the period from February to July (2002) in Ibin Al-Bietar Center for Cardiac Surgery in Baghdad.

A total of 400 inpatients, 200 patients diagnosed with acquired coronary heart disease and 200 without heart disease were included in this study, the age range was 35-70 years, attending the department of cardiology of this center, complaining from chest pain.

Clinical examination: Oral examination of the study groups done after cardiac catheterization, while the control group examined when the patients attend the non-invasive department of the center , in this department the patient undergo all clinical examinations for the patients to exclude any coronary heart disease ,whereas the oral examination of the control group were established there.

The periodontal health condition was estimated by community periodontal index CPI (WHO 1997) using CPI probe.

The loss of attachment was examined for each sextant and was recorded immediately after recording (CPI) according to criteria by WHO 1997.

Teeth extracted due to caries, periodontal disease or others were recorded as missing.

Statistical analysis: Calculation of statistical parameters (mean, standard deviation) were accomplished, chi square test. Using SPSS program (ver.10).

Results:

The total sample consisted of 400 patients with an age range of (35-70) years old, 200 patients diagnosed with coronary heart disease (CHD), 152(76%)were males and 48(24%)were females. Those were compared to a control group of 200 subjects who were diagnosed without CHD, 145 (72.5%) of them were males and the rest of them were females (table1 and 2). The mean age for total sample (49±9.5) years.

Table (1): Distribution of the study and control groups stratified by age and sex.

Age group (year)	Sex	Study group		Control group	
		NO	%	NO	%
35-49	M	77	38.5	78	39.0
	F	23	11.5	27	13.5
	T	100	50.0	105	52.5
50-70	M	75	37.5	67	33.5
	F	25	12.5	28	14.0
	T	100	50.0	95	47.5

Table (2): Mean and SD of total sample stratified by age and sex.

Study group				
Age group (years)	Sex	No	Mean	SD
35-49	M	77	41.75	4.94
	F	23	39.69	4.44
50 - 70	M	75	56.76	6.49
	F	25	57.08	5.64
Control group				
35-49	M	78	41.06	4.36
	F	27	41.92	3.33
40- 70	M	67	58.59	6.07
	F	28	54.60	5.12
Total	Total M & F	400	49.00	9.57

Table (3) illustrates the periodontal condition of the total sample according to the categories of CPI. This table clearly showed that highly significant differences were noticed between the values of the study group and control group, in score (0), 7%and 17.5% respectively. Similar finding were observed when compared with the males and females in the study group to their corresponding controls for each age group. Assessment of periodontal condition showed that dental calculus to be the predominant score in CHD patients 32% while 28.2% in control. While the percentage of gingival bleeding was11.6% among the study group while 23.0%in their control. For the total sample a statically high significant differences in periodontal condition observed between control and study groups in relation to the age and sex groups (X^2=25.05 d.f=3 $p<0.0001$).

The loss of attachment in both CHD and control subjects, was increased with age .CHD patients had loss of attachment 6-8 mm 20.4%higher than non CHD individuals 11.1%for age group 35-49 years, loss of attachment (LA) 9-11 mm had been found more in CHD group 46.3%than their corresponding control 26.3%for age group 50-70 years, (LA) >12mm observed only in one subject in non-CHD group. Highly significant difference in loss of attachment between male and female among the two age groups in study group were not significant while in control group in relation to the age and sex were significant ($P<0.01$) , between the total was highly significant table (4).

Table (3): Distribution of total sample according to the periodontal condition stratified by age and sex, periodontal condition.

Age group (year)	Sex	Study group								Control group											
		Healthy		Bleeding		Calculus		Pocket 4-5mm		Pocket ≤6mm		Healthy		Bleeding		Calculus		Pocket 4-5mm		Pocket ≤6mm	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
35-49	M	7	9.09	9	11.6	25	32.4	23	29.8	13	16.8	15	19.2	18	23.0	22	28.2	14	17.9	9	11.5
	F	4	12.1	3	9.09	10	30.3	6	18.1	10	30.3	8	29.6	10	37.0	9	33.3	0	0.0	0	0.0
	T	11	11	12	12	35	35	29	29	23	23	23	21.9	28	26.6	31	29.5	14	13.3	9	8.5
50- 70	M	2	2.6	3	4	12	16	34	45.3	24	32	9	13.4	10	14.9	8	11.9	19	28.3	21	31.3
	F	1	4	2	8	5	20	10	40	7	28	3	10.7	10	35.7	8	28.5	7	25	0	0.0
	T	3	3	5	5	17	17	44	44	31	31	12	12.6	20	21.05	16	16.8	26	27.3	21	22.1
Total	T	14	7	17	8.5	52	26	63	31.5	54	27	35	17.5	48	24	47	23.5	40	20	30	15

(35-49) X^2=3.57 P>0.05 N.S
(50-70) X^2=1.10 P>0.89 N.S

X^2= 25.05 P<0.0001 H.S
X^2=15.94 P< 0.003 H.S

X^2=10.20 P<0.03 Significant

Table (4):- The pattern of loss of attachment within total sample stratified by age and sex. Loss of Attachment (LA)

Age group (year)	Sex	Study group												Control group							
		0-3 mm LA		4-5 mm LA		6-8 mm LA		9-11 mm LA		≥12 mm LA		0-3 mm LA		4-5 mm LA		6-8 mm LA		9-11 mm LA		≥12 mm LA	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
35-49	M	41	19.2	23	20.4	11	20.4	2	10.5	0	0.0	55	25.8	14	12.4	6	11.1	3	15.8	0	0.0
	F	17	8.0	6	5.3	0	0.0	0	0.0	0	0.0	27	12.7	0	0.0	0	0.0	0	0.0	0	0.0
	T	58	27.2	29	25.7	11	20.4	2	10.5	0	0.0	82	38.5	14	12.4	6	11.1	3	15.8	0	0.0
50-70	M	17	8.0	34	30.1	17	31.5	7	36.8	0	0.0	27	12.7	19	16.8	15	27.8	5	26.3	1	100.0
	F	8	3.8	10	8.8	5	9.3	2	10.5	0	0.0	21	9.9	7	6.2	0	0.0	0	0.0	0	0.0
	T	25	11.8	44	39.9	22	40.8	9	46.3	0	0.0	48	22.6	26	23.0	15	27.8	5	26.3	1	100.0
Total	T	83	41.5	73	36.5	33	16.5	11	5.5	0	0.0	130	65	40	20	21	10.5	8	4	1	0.5

(35-49) X^2=5.27 P>0.05 N.S X^2=10.19 P<0.01 Significant (50-70) X^2=0.87 P>0.05 N.S X^2=13.56 P<0.001 H.S

X^2=19.90 P<0.001 H.S

Missing teeth mean values increase with age to reach the highest at 50<70years. Concerning sex variation there was significant differences between the two sexes in the mean of MT value ($p<0.05$) in the control group, while no statistical differences in the study group. The dentate subjects in non-CHD group had higher percentage of MT than CHD patients. The distribution of the sample in age and sex was shown in table (5). There was a statistically highly differences concerning MT among different groups ($p<0.001$).

Table (5):- Numbers and percentages of subjects with missing teeth (MT) stratified by age and sex

Study group								
Age group (years)	0-3 MT		4-7 MT		8-11 MT		≥ 12 MT	
	No	%	No	%	No	%	No	%
35-49	63	63	31	31	5	5	1	1
50-70	34	34	42	42	21	21	3	3
Total	97	48.5	73	36.5	26	13.0	4	2.0
	Control group							
	No	%	No	%	No	%	No	%
35-49	59	56.2	36	34.3	6	5.7	4	3.8
50-70	24	25.3	46	48.4	22	23.2	3	3.2
Total	83	41.5	82	41.0	28	14.0	7	3.5

Study group								
Sex groups	No	%	No	%	No	%	No	%
Male	74	48.7	56	36.8	18	11.8	4	2.6
Female	23	47.9	17	35.4	8	16.7	0	0.0
Total	97	48.5	73	36.5	26	13.0	4	2.0
Control group								
Sex group	No	%	No	%	No	%	No	%
Male	49	33.8	61	42.1	28	19.3	7	4.8
Female	34	61.8	21	38.2	0	0.0	0	0.0
Total	83	41.5	82	41.0	28	14.0	7	3.5

Discussion:

The present study is the first Iraqi endeavor to deal with oral health problems as a risk factor among the Iraqi acquired coronary heart disease patients .So that the results of the present study are compared to those conducted in other countries on CHD patients. The present study had shown that patients with acquired CHD had worse oral health status than controls, which agree with other study [8] Possible explanations can be considered; First periodontitis and CHD share several common etiological factors e.g. low socioeconomic state, smoking, and diabetes. Second, subjects who take care of their dentition may also be concerned about other aspects of their health, including a lifestyle conductive to CHD [9] .Severe periodontal breakdown and CHD are more common in older than in younger person and in men more than women [10,11] the same finding of this study.

It has been observed in the current study that patients with CHD have severe periodontitis more than patients without CHD [12,13] .

The loss of attachment in CHD patients of the present study increase with age and (LA) higher than control [8,12,14] this is due to poor oral hygiene and severe periodontitis.

There was a high significant differences between study and control group regarding the number of missing teeth , this was in agreement with other study [14] and in reveres to another study [16] .Also in this study women had more MT than men with increasing age which in accordance to some Iraqi studies [3,17] . This relationship appears clearly after menopause due to changes in hormone level [18] . Patients in control group had more missing teeth, these people coincidentally had the tooth –related microbial challenge removed that had been a major contributor to the events leading to their heart attack [19] .

In conclusion it was concluded that periodontal disease more common among patients with CHD than control. Thus the possibility of chronic oral infection or similar factor may be positively associated with CHD at least in form patients susceptible to CHD.

Therefore the concept of using dentists as screeners as well as monitor for underlying systemic conditions is an important aspect of early detection and prevention of numerous medical conditions and one of them heart attack.

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