

Periodontal Disease as a Risk Factor for Coronary Artery Disease

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Abstract: There are many risk factors for coronary artery disease (CAD) and periodontal disease (PDD) is a controversial risk factor. The aim of this study was to show the association between CAD and PDD. A case-control study was designed. Sixty one patients that CAD was confirmed in them by coronary angiography compared with sixty one patients with normal angiography. PDD was evaluated by two indices, gingival index and periodontal disease index. Odds ratio was calculated for the risk of PDD for CAD. The results were shown no differences between groups about sex, age, educational level and occupation. The odds ratio of periodontal disease for CAD was 58 with CI95% (51-65). The relationship between tooth frequency and CAD was not statistically significant. Finding of the current study suggested that periodontal disease is the risk factor for CAD. However more clinical studies especially prospective longitudinal studies were recommended.

Key words: Coronary artery disease, periodontal disease, risk factor, Iran

INTRODUCTION

Coronary artery disease (CAD) remains the principal cause of death in most countries, despite significant preventive and therapeutic advances. It has many known risk factors like, Hypertension, Hyperlipidemia, Diabetes mellitus, Positive Family history, Smoking and so on. But many conditions increase risk of CAD, yet, through atherosclerosis. It seems this phenomenon becomes inflammatory^[1]. Results of several cross-sectional^[2,3] and case-control^[4,5] studies have raised the possibility that persons with periodontal disease may have increased risk of cardiovascular disease. This relationship is difficult to validate because of the kind of study design and outcome of measurement of periodontal disease or infection^[6]. For confirmation of relationship between CAD and periodontal disease prospective study or valid and reliable indices for gingival and periodontal assessment required. Many past study assessed the periodontal condition a quantifying oral health like total dental index or pantomographic index and in the same studies researchers could not diagnosed CAD as valid and reliable measures^[6].

This report we showed the relationship between periodontal disease with valid indices and CAD which was diagnosed by angiography.

MATERIALS AND METHODS

One hundred twenty two patients who had done coronary artery angiography were selected. The half of them had coronary artery disease (CAD) and had up to 75% obstruction in these arteries and the others was

considerable healthy about CAD. All these examine by 2 dentists, general dentist and a periodontal specialist. At first, they were asked from history of their disease and collected clinical and para-clinical data prospectively and retrospectively from their medical documents. Then the periodontist without knowing about the patients group examined and checked up their tooth and he done gingival exam. For evaluation of periodontal disease two indices were used:

1. Gingival Index (GI) which its range was 0 to 3 and was graded to mild 0 to 1, moderate 1.1 to 2 ,and severe 2.1 to 3.
2. Periodontal disease index (PDI) that is different range for it and it is depending on teeth number.

The finding registered to a data collection from and analyzed by computer with SPSS-11.5 software.

Descriptive statistics (mean \pm -standard deviation(SD)) were calculated for each parameter measured for each subject groups and tested with student t test.

Group comparisons for non-parametric variables were performed by Chi square test. Odds Ratio (OR) was calculated for risk of periodontal disease in CAD and tested with Maentel-Haentzel test. The significance level was $P < 0.05$ for all analysis.

RESULT

The two groups were matched together from sex and age. There were 36 males and 25 females in each group. The mean age for case group was 51.1 \pm -7.3 (mean \pm -SD) and 51.3 \pm -10.3 years for control group. The rates of hypertension, hyperlipidemia, previous myocardial infarction and smoking were higher

significantly in case group than the other group one. The GI average was higher in patients with CAD than control group significantly as like PDI (Table 1).

The odds ratio of periodontal disease for CAD was 58 with CI95% (51-65) (Table 2).

The relationship between tooth frequency and CAD was not statistically significant (Table 3).

Table 1: Periodontal parameters in the two subject group

Parameter Index	Mean	SD	P value*
GI			
Case	0.82	0.04	P<0.0001
Control	0.41	0.02	
PDI			
Case	4.19	1.93	P<0.0001
Control	2.27	2.05	

* Student t test

Table 2: Frequency of periodontal disease in CAD and normal people

Periodontal disease	CAD	
	Positive	Negative
Positive	60	31
Negative	1	30

Odds Ratio=58 CI95% = (51-65)

Mantel-Haentzel test P<0.0001

Table 3: Frequency of tooth in two subject group

Tooth	Group		
	Case	Control	Total
<13	30	21	51
14-18	14	23	37
>18	17	17	34
Total	61	61	122

DISCUSSION

Our results suggest that periodontal disease is the risk factor for CAD. Many studies have demonstrated that CAD is linked to periodontal disease^[3-9]. Periodontal pathogens have recently been identified in atherosclerotic lesion^[10-12] and periodontal pathogens invade to human coronary cells^[13]. Janket et al in the Meta analysis of the large series of studies determined that periodontal disease appears to be associated with a 19% increase risk of future cardiovascular disease. This increase in relative risk is more prominent (44%) in persons aged<65 years. Although the increment of risk between subject with or without periodontal disease in the general population is modest, at around 20% because nearly 40% of population has periodontal disease. This modest increase may have a profound public health impact^[14].

Our finding showed that the attributable risk of periodontal disease for CAD is 49% which greater than 19% of Janket meta analysis.

The severity of periodontal disease in our patients was more than the other studies, thus the risk of it has been high. However, the cross-sectional and case-

control studies can not define the relationship between periodontal disease and CAD as well as cohort study.

Several cohort studies reported that periodontal diseases were found to be a significant predictor for future cardiovascular events^[15-18].

The current study substantiated the result of previous study ad determined the relationship between periodontal disease and CAD. There were many problems in this study like low sample size and retrospective design. We suggested for next study prospective design like cohort study and long life follow up with appropriated sample. Different indices and pathology change have to evaluate as outcomes. After these improvements perhaps can confirm the relationship between periodontal disease and cardiovascular disease.

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