



Periodontal Disease and Coronary Heart Disease

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Abstract

The epidemiological cohort randomized studies have demonstrated an association between periodontal disease and coronary heart disease. The study was conducted on 241 subjects with verified CHD from a Department of Cardiology and 50 subject without CHD from Govt. Dental College PGIMS, Rohtak. Information on diabetic states, smoking habits, alcohol consumption and lipid profile was obtained. Full month probing depth, clinical loss of attachment and bleeding on probing was performed. The CHD group had a significantly higher probing depth, clinical loss of attachment and bleeding on probing while lipid profile become opposite as compared to non-CHD group. Clinical loss of attachment increase with risk factors such as smoking, alcoholism, male, increasing age, triglycerides and HDL-C levels. The present study showed a positive association between periodontal disease & CHD in agreement with previous studies.

Key Words

Periodontal Disease, Cardiovascular Disease, CHD

Introduction

Epidemiological associations between periodontitis and cardiovascular disease have been reported (1,2). This could be directly due to periodontal pathogens or their products on endothelial cells via transient bacteremia or indirectly due to products of the inflammatory response, central role in pathogenesis of cardiovascular disease (3,4). Periodontitis and atherosclerosis have complex aetiologies, genetic and gender predispositions and may share pathogenic mechanisms as well as common risk factors. Several short term intervention studies have reported that treatment of periodontitis reduces the serum concentrations of inflammatory markers (5). Studies have linked several of risk factors to periodontal disease, including diabetes, smoking, age, gender, and low socioeconomic status. The purpose of this study was to investigate whether prevalence of periodontal disease among CHD patients could be explained, at least in part, by some common factors.

Materials and Methods

The 241 CHD diagnosed patients (mean age 41 + 1.2 years, 133 M: 109F) were selected from Lal Sham Lal Superspecialities Centre, Cardiology, PGIMS Rohtak (INDIA). Participants with chronic inflammatory disease, HIV, a history of organ transplant, or any cancer treatment 6 months before examination were excluded during the selection period. To confirm the diagnosis of individuals with CHD by coronary angiography Echo cardiography and electrocardiogram. A dentist (BR) performed the oral examination at LSL, Department of Cardiology. The

clinical examination such as probing depth, recession and bleeding on probing was carried out. The 50 non-CHD systemic health periodontally compromised patients act as (control) selected for study (All cardiac, no symptoms of cardiac disease on medical examination). The total serum cholesterol, low density lipoprotein cholesterol and high density lipoprotein was estimated enzymatically.

Statistical Analysis

The data was analyzed by SPSS 7.0 and student 't' test was applied for statistical analysis.

Results

The CHD patients showed significantly higher loss of clinical attachment, probing depth, missing teeth as compared to non-CHD patients ($p < 0.01$) except bleeding on probing lower in CHD although value was insignificant (*Table 1*). Risk factors such as diabetes, alcoholic, female were significantly higher in non-CHD patients as compared to CHD patient while risk factors such as non-alcoholic, male are significantly higher in CHD patients as compared to non-CHD patients HDL-C, LDL-C and triglyceride value are significantly higher in non-CHD patients as compared to CHD (*Table 2*). The participants grouped into group I, group II and group III as per probing depth showed statistically significant differences in smoker, alcoholic, male and age (*Table-3*).

Discussion

In the present study, we found significantly higher loss of clinical attachment, probing depth, missing teeth as compared to non-CHD patient, this results support

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previous studies (5-7). Bleeding on probing lower in CHD which contrary with previous study (8), it was due to cardioprotective drug. We found poorer out comes for all periodontal variables except bleeding on probing among CHD patients as compared to non-CHD patients. Risk factors such as diabetes, alcoholic, female were more predominant in non-CHD patients, it may be due to estrogen (Hormone) in female, low dose intake of alcohol, may be anti- diabetic drug. Male was predominant risk factor in CHD as compared to non-CHD which consistent previous study (9). In our study, it is evident that periodontal disease and CHD share common risks factor

Table 1. Association Between Coronary Heart Disease and Oral Variables

Oral variables	CHD (N=133)	Non-CHD (N=109)
PD probing depth (in mm)	4.3 + 1.2	3.9 + 1.5
CAL (in mm)	6.3 + 1.4	5.7 + 1.2
BOP (in %)	42.8	41.3
Missing teeth (in number)	6.6 + 1.3	5.2 + 1.6

$P < 0.01$

such as diabetes, male, smoking, which support previous study (9-11). Smoking and diabetes are known to induce changes in the microvascular function affecting the peripheral circulation, gingival tissue (12,13). Smoking and diabetes were known to be associated with a greater susceptibility to infections as C.pneumoniac(14,15). Clinical loss of attachments significantly in area with smoker, alcoholic, male, advancing age, triglycerides and HDL-C level while diabetes, LDL-C increase upto 6 mm i.e. upto group II. The fact that CAL is associated with CHD reported in previous study (16). The level of HDL-C, LDL-C & triglycerides level higher in non-CHD as compared to CHD, which are contrary to previous study (17), it may be due to cardioprotective drug.

Conclusion

In the present study we observed a positive association between periodontal disease & CHD.

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Table 2. Association Between Coronary Heart Disease and Cardiovascular Risk Factors

Risk factors	CHD (n=41)	Non-CHD (n=50)
Diabetic	4.5	9.2
Smoker	92.9	90.6
Non smoker	7.1	9.4
Alcoholic	44.8	81.7
Non alcoholic	55.2	18.3
Male	90.8	40.7
Female	19.2	60.3
Age	41.5 + 11.2	42.8 + 11.3
Triglyceride (mmol)	1.2 + 0.5	2.3 + 0.7
HDL-C (mmol)	0.9 + 0.3	1.5 + 0.4
LDL-C (mmol)	2.3 + 0.5	3.8 + 0.6

Table 3. Association Between Clinical Loss of Attachment and Cardiovascular Risk Factors

Risk factors	Group I (2-4 mm)	Group II (4.1-6 mm)	Group III (6-8 mm)
Diabetic	2.0	9.2	9.2
Smoker	64.3	79.2	81.4
Alcoholic	33.2	48.3	53.3
Male	48.2	56.4	78.4
Age	41.3 + 11.7	54.3 + 13.8	64.3 + 11.2
TG mmol	1.9 + 1.3	2.3 + 1.2	2.4 + 1.2
HDL-C mmol	0.7 + 0.3	1.3 + 0.4	1.6 + 0.7
LDL-C mmol	3.6 + 0.4	3.6 + 0.4	3.7 + 0.4

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