

Comparative evaluation of periodontal indices in patients with ischemic heart disease and positive myocardial perfusion scan

Arabi, SR. * Torkzaban, P. * Gholami, L. ** Taghavi, M. *** Hatami, M. ****

* Assitant Professor, Department of Periodontology, Faculty of Dentistry, Hamadan University of Medical Sciences, Hamadan, Iran.

** Post graduate student of Periodontology Faculty of dentistry, Hamadan University of Medical Sciences

*** Nuclear Medicine Specialist, Hamadan, Iran.

**** Dentist

ABSTRACT

Statement of the problem: Periodontitis is a common infectious disease that can be affected by different factors. Periodontal conditions can be influenced by systemic diseases and they also can act as risk factors for some systemic diseases. Several studies have been carried out on the relationship between cardiovascular disease and periodontal disease.

Purpose: The purpose of our study was to evaluate periodontal indices in patients with ischemic heart disease who had a perfusion scan taken in a private gamma scan center in Hamadan.

Materials and Methods: This case control study was carried out on 40 patients who were referred by a cardiologist to the Gamma Scan Center in Hamadan for taking a myocardial perfusion scan. The patients were periodontally examined and periodontal indices were recorded for each patient. The patients were then divided into two groups. The case group consisted of 20 patients with positive heart scan results and the control group consisted of 20 subjects with negative heart scan results. The two groups were matched in age and gender. Data were analyzed by SPSS, Version 11. Chi-square test was used for comparing gingival indices (GI) in both groups.

Results: In this study, 40 patients consisting of 26 females (65%) and 14 males (35%) were examined. The mean age of patients was 54.45 years in the case group and 54.30 years in the control group. There were significant differences between the means of all indices except the plaque indices.

Conclusion: This study showed higher incidence and more severe periodontal diseases in patients with positive perfusion scan.

Keywords: Myocardial perfusion scan, Myocardial Ischemia, Periodontal index

INTRODUCTION

Periodontal diseases are one of the most common diseases with an infectious origin resulting in inflammatory destruction of periodontal tissues. These diseases are caused by contact of the periodontium with more than 500 different species of bacteria found in the dental plaque and also by the

host response to the bacteria and their product⁽¹⁾. Periodontal conditions can be influenced by some systemic diseases and they also can act as risk factors for some other systemic diseases⁽²⁾. For example, inflammation has a proven role in the pathogenesis of cardiovascular disease. Which is one of the major causes of death in most communities. In 2003 cardiovascular diseases caused 16.7 million deaths worldwide⁽³⁾. It is interesting that the classic risk factors of cardiovascular diseases such as high blood pressure and smoking have an effect on only two thirds of

•**Corresponding Author:** P. Torkzaban Address: Member of Research Center for Health Science and Assisstant Professor, Dept. of Priodontology and of Faculty of Dentistry of Hamadan University of Medical Sciences, Fahmideh Blv, Hamadan, Iran. Tel: +98 811 8354018 Email: Torkzaban@umsah.ac.ir

the cases of cardiovascular diseases. Therefore, it is necessary to evaluate other possible risk factors. According to some studies, mortality rate in cardiovascular patients with periodontal disease is 1.5-2 times higher than patients without periodontal disease^(4,5). Several studies have been carried out on the relationship between cardiovascular disease and periodontal disease^(6,10). Recent meta-analysis studies have shown that the risk of developing cardiovascular diseases seems to be significantly higher in patients with periodontal disease^(11,12). In these studies different diagnostic methods had been used for diagnosis of ischemic heart disease. In the current study to diagnose ischemic heart disease, myocardial perfusion nuclear scanning method was used. With regard to the high prevalence of cardiovascular disease and periodontal disease in Iran, this study was conducted to evaluate periodontal indices in patients with ischemic heart disease who referred to the private scan center (Gamma Center) in Hamadan.

MATERIALS AND METHODS

This case control study was carried out on 40 patients who were referred by a cardiologist to the Gamma Center in Hamadan City for taking a myocardial perfusion scan. Exclusion criteria consisted of having a history of diabetes and smoking. The patients were then divided into two groups. The case group consisted of 20 patients with positive heart scan results and the control group consisted of 20 subjects with negative heart scan results. The patients were periodontally examined and periodontal indices including probing depth

(DP), clinical attachment levels (CAL), gingival bleeding (BOP), plaque index (PI), gingival index (GI) and also the total number of lost teeth were all recorded. The two groups were matched in age and gender. Clinical attachment level and PD were measured using a Williams's periodontal probe on six regions of each tooth (mesiobuccal, midbuccal, distobuccal, mesiolingual, midlingual and distolingual) and the deepest levels were recorded. Data were analyzed by SPSS, Version 11. The mean values of PI, BOP, and CAL, PD, gingival recession and number of lost teeth were compared using T-tests. Chi-square test was used for comparing the gingival indices (GI) in both groups. P-value of less than 0.05 was considered to be statistically significant.

RESULTS

In this study, 40 patients consisting of 26 females (65%) and 14 males (35%) were examined. The mean age of the patients was 54.45 years in the case group and 54.30 years in the control group. Table 1 summarizes the mean values of periodontal indices in the two groups (case and control groups). According to Table 1, there were significant differences between the means of all indices except the plaque indices in the two groups. Table 2 shows the percentage of gingival indices in the two groups. In general, the percentage of patients with gingival inflammation was higher in the case group compared to the control group. Moderate gingival inflammation was the most common type of gingival inflammation with 42.42% in the case group and 19.77% in the control group.

Table 1: The means of periodontal indices in the two groups (case and control).

Measured values (mean)	Probing depth(mm)	Gingival recession(mm)	Attachment level(mm)	Bleeding index (%)	Plaque index (%)	Total No. of lost teeth
Control group (mean±SD)	4.72±1.08	1.03±0.85	6.8±3.57	10.47±10.39	57.56±10.49	21.43
Case group (mean±SD)	7.63±2.2	2.38±0.56	11.85±6.97	26.77±19.88	61.18±15.47	42.33

t.test(P<0.05)

Table2: The percentages of gingival index in the two groups (case and control).

groups	Normal gingiva (%)	Mild inflammation (%)	Moderate inflammation (%)	Severe inflammation (%)
Case group	54.84	0.30	42.42	2.44
Control group	78.87	0	19.77	1.36

DISCUSSION

In this study, the nuclear cardiac perfusion scanning method was used for diagnosis of ischemic heart disease and the periodontal indices in 20 patients with heart disease and 20 subjects without any heart disease were evaluated. The mean probing depth was 7.63 mm in the case group and 5.34 mm in control group. This finding is different from the study of Willershausen *et al.* indicating that the mean probing depth were 3.4 mm in case group and 2.4 mm in control group⁽⁹⁾.

In our study, CLA was 11.85mm in the case group which was higher than the controls (6.8 mm). Lopez *et al.* also found higher CAL in the case group. In this study the mean level ranged between 1.04-5.71 mm in

the case group and 0.05-4.05 mm in the control group⁽¹³⁾. Sadeghi *et al.* reported that CLA of more than 4 mm in the patients group was 35.41% compared with the control group with 15.84% which was 1.02 times more⁽¹⁴⁾. In Sadeghi *et al.* study, PI was 57.28% and 35.37% in the case group and control group, respectively. This difference was statistically significant. In our study, PI was 61.8% in the case group and 57% in the control group, but the difference was not statistically significant. In our study, the mean bleeding index in the case group was higher than the controls, which were 26.77% and 10.46%, respectively. These results are in agreement with Sadeghi *et al.* study reporting 36.2% in

the case group and 18.6% in the control group but are different from those reported by Czerniuk *et al.* which was 80% in the case group^(7,9). This might be resulted due to the exclusion of patients taking anticoagulants in our study. According to these findings, all indices (except the plaque indices) and also the total of lost teeth were higher in the case group compared to the controls (Table 1).

CONCLUSION

This study showed higher incidence and more severe periodontal diseases in patients with positive perfusion scan.

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