

Abstract

BACKGROUND

The over-production of reactive oxygen species (ROS) associated with the pathogenesis of several disorders such as diabetes mellitus (DM) and periodontal disease (PD) can contribute to injury of the host tissue, significant impairment to cell integrity and can cause oxidative damage to a large number of molecules such as carbohydrates, lipids and DNA. Because the oxidative stress is intrinsically related to the pathogenesis of type 2 diabetes, dyslipidemia and PD, and it lead to DNA damage. One of the most established methods for evaluating DNA damage is the micronucleus (MN) test. The ROS-mediated tissue destruction could be measured by the final product of lipid peroxidation (LPO), such as malondialdehyde (MDA). C-reactive protein (CRP) an acute-phase protein found in the blood, the levels of which rise in response to inflammation is linked closely to diabetes and periodontal infection.

AIM OF THE STUDY

The aim of the study was to evaluate the effect of non-surgical periodontal therapy on the micronuclei frequency, serum Malondialdehyde and serum Hs – CRP levels in chronic periodontitis patients with and without well controlled type 2 diabetes mellitus and healthy controls.

OBJECTIVES

- (i) To assess the micronucleus frequency (MNF), as a biomarker for DNA damage in peripheral blood, in chronic periodontitis patients, with and without well controlled type 2 diabetes mellitus and healthy controls.

- (ii) To evaluate and compare free radical damage in the form of serum malondialdehyde (MDA) levels in chronic periodontitis patients, with and without well controlled type 2 diabetes mellitus and healthy controls.
- (iii) To assess the serum high sensitive C – Reactive protein level in chronic periodontitis patients, with and without well controlled type 2 diabetes mellitus and healthy controls.

MATERIALS AND METHODS

This was an interventional study including a total of 83 participants (28 chronic periodontitis with well controlled type DM, 27 chronic periodontitis and 28 healthy controls) of which 75 patients completed the three months follow-up protocol. Clinical parameters (PI, GI, PPD and CAL) and laboratory parameters (RBS, total cholesterol, triglycerides, CBMN frequency, HbA1c (%), MDA, and Hs-CRP) were recorded at baseline and three months following non-surgical periodontal therapy.

RESULTS

In the present study at baseline all the periodontal parameters like PI, GI, PPD, and CAL were elevated in group 1 and group 2 than group 3. There was no statistical difference in PI, GI at baseline among three groups. In terms of mean PPD and mean CAL was more in DM group compared to CP group. In other words chronic periodontitis with well controlled type 2 DM had more periodontal breakdown than in patients with chronic periodontitis alone. This shows that DM has additional effect on periodontium. 3 months after SRP all the clinical parameters are reduced significantly in all the groups. Similarly laboratory parameters like RBS, total cholesterol, triglycerides, CBMN frequency, MDA, and Hs-CRP levels were

elevated in group 1 and group 2 than group 3. These values significantly declined three months after non-surgical periodontal therapy.

CONCLUSION

Mean CBMN frequency, MDA, and Hs-CRP levels were elevated in individuals with chronic periodontitis and chronic periodontitis patients with well controlled type 2 diabetes mellitus. This study provides evidence that non-surgical periodontal therapy contributes to reduction in CBMN frequency, serum MDA, and serum Hs-CRP levels in these patients. Larger clinical trials are needed to confirm these findings.