

ASSESSMENT OF BLOOD AND SALIVARY ANTIOXIDANT SYSTEM IN SUBJECTS WITH PERIODONTITIS AND PERI-IMPLANTITIS

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Lipid peroxidation has been shown to cause a profound alteration in the structural integrity and functions of cell membranes. Free radical-induced lipid peroxidation has been implicated in the pathogenesis of several pathological disorders. Peri-implant and periodontal diseases are inflammatory disorders that damage the bone and connective tissue that support the teeth or the implant. Elevated lipid peroxidation and disturbed antioxidant status has been reported in experimental periodontitis. In peri-implantitis a variety of molecular species appears in the inflamed tissues, among them reactive oxygen species (ROS). The human body does contain an array of antioxidant defence mechanisms (non-enzymatic and enzymatic antioxidants) to remove harmful ROS. The non-enzymatic antioxidants include glutathione (GSH) and ascorbic acid (AA) while the enzymatic antioxidants include glutathione peroxidase (GPx), glutathione reductase (GR) and superoxide dismutase (SOD). In this study, we assessed the levels of oxidative stress in saliva and blood in periodontitis and peri-implantitis sufferers by analyzing the status of lipid peroxidation (as levels of MDA) and the antioxidant defence systems (as levels or activities of GSH, AA, GPx, GR and SOD). Twenty patients with periodontitis, 10 patients with peri-implantitis and 15 healthy subjects were enrolled in this study. The levels of MDA, the levels of non-enzymatic and the activities of enzymatic antioxidants were assayed using spectrophotometric and HPLC methods. Plasma and saliva of periodontitis ($p < 0.01$ and $p < 0.05$ respectively) and peri-implantitis ($p < 0.001$) sufferers showed a significantly higher MDA level than the healthy subjects. In the erythrocytes and saliva enzymatic antioxidant activities of GPx and SOD ($p < 0.05$ both antioxidant and $p < 0.01$ and $p < 0.001$ in saliva respectively) of periodontitis and peri-implantitis sufferers, were found to be significantly higher, whereas the levels of non-enzymatic antioxidants (GSH plasma $p < 0.05$ both sufferers; AA plasma, $p < 0.05$, $p < 0.01$ and saliva $p < 0.05$, $p < 0.01$ respectively) were significantly lower (except for GSH in saliva of periodontitis, $p < 0.05$ and peri-implantitis, $p < 0.001$ sufferers where the levels were significantly higher) relative to the parameters found for healthy subjects. The disturbance in the endogenous antioxidant defence system due to the over-production of ROS and lipid peroxidation products at inflammatory sites can be related to a great degree of oxidative stress in patients with periodontitis or peri-implantitis.