

Oxidative Stress in Periodontal Pockets

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Periodontal disease is triggered by bacteria, but the damage to connective tissue and bone is done by the body's own immune system. White blood cells travel from blood vessels in healthy connective tissue to the sulcus to attack the bacteria. On the way they release enzymes as they pass through the tissue causing destruction of healthy cells along the way and causing release of free radicals and triggering oxidative stress. This cascade of events is complex, destructive and leads to the expression of pro-inflammatory genes that continue the tissue damage.

In defense, healthy cells produce antioxidants, like glutathione, a small molecule made from three amino acids that can neutralize free radicals. Higher levels of glutathione are evident in the gingival crevicular fluid of periodontal pockets, as a measure of defense activity. These levels are higher than in a healthy sulcus.

Researchers at the University of Birmingham in the United Kingdom compared glutathione levels in gingival crevicular fluid from 20 subjects with moderate periodontal disease and 20 healthy controls. At baseline, levels were much lower in healthy controls. Three months following non-surgical therapy, glutathione levels in those with periodontal disease were reduced and were closer to those of the healthy controls.

Clinical Implications: Periodontal tissue destruction results from oxidative stress and the release of free radicals. Future periodontal treatment will likely include the impact of antioxidants in the treatment and control of periodontal disease.

Grant, M., Brock, G., Matthews, J., Chapple, I.: Crevicular Fluid Glutathione Levels in Periodontitis and the Effect on Non-Surgical Therapy. *J Clin Perio* 37: 17-23, 2010.

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