The role of periodontitis and hepatocyte growth factor in systemic inflammation

av

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Abstract


An essential goal in addressing inflammation is the return of tissue to homeostasis. Persistent infections often cause prolonged response and accumulation of immune cells, inducing imbalance in pro- and anti-inflammatory mediators, tissue destruction, and chronic inflammation. In periodontal disease, bacteria of the dental plaque are the primary aetiologic agents. Coronary artery disease (CAD) and chronic renal failure (CRF) are associated with periodontitis and involve systemic inflammation with atherosclerotic and fibrotic processes.

The aims of this thesis were to study the effect of the bacterium Porphyromonas gingivalis and the anti-inflammatory mediator lipoxin A₄ (LXA₄) on blood cells in vitro, as well as to measure the expression of hepatocyte growth factor (HGF) in patients with periodontitis, CAD, and CRF. We found that LXA₄ inhibits P. gingivalis–induced leukocyte-platelet aggregation and reactive oxygen species (ROS) production in whole blood, by antagonizing the upregulation of CD11b/CD18 on leukocytes. The serum concentration of HGF was elevated in patients with periodontitis, CAD and CRF, indicating a systemic inflammation. However, the biological activity of HGF was reduced in serum from CRF patients and in saliva and gingival crevicular fluid of patients with periodontitis. This finding correlated with reduced growth of gingival epithelial cells incubated with saliva from patients with periodontitis. Neutrophil proteases reduced the biological activity of HGF in patients with CRF, and HGF expression in patients with periodontitis was associated with higher concentration and numbers of species of periodontal bacteria.

In conclusion, these studies suggest that systemic spreading of periodontal bacteria, leukocyte-platelet activation and disturbed HGF-expression are crucial components involved in tissue degradation and progression of chronic inflammation.

Keywords: Hepatocyte growth factor, Porphyromonas gingivalis, periodontitis, systemic inflammation, coronary artery disease, chronic renal failure, lipoxin.

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