PHILIPS

Investigation of adiponectin isoforms in saliva as potential biomarkers in periodontal disease

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Background: Adiponectin is an adipokine (a cytokine secreted by adipose tissue) that has generally been reported to possess anti-inflammatory properties. However, recent studies in rheumatoid arthritis (RA) reveal a potent pro-inflammatory role for adiponectin. In addition, the effects of adiponectin were inhibited by anti-TNF-α treatment, indicating that adiponectin could be a potential therapeutic target in managing inflammation. I have previously identified increased concentrations of adiponectin in gingival crevicular fluid (GCF) in patients with periodontitis and a reduction of adiponectin levels after periodontal treatment (data in submission). Adiponectin exists in three isoforms (trimer, hexamer, multimer). Standard ELISAs do not differentiate between the isoforms but only measure total adiponectin. However, in vitro studies emphasize that each isoform has distinct properties, and pro-or anti-inflammatory actions of adiponectin likely depend on which isoform is present and in what proportions. Additionally, shifts in isoform proportions have been observed in a number of inflammatory diseases (obesity, atherosclerosis and diabetes). To date, isoform proportions are unknown in periodontitis, yet this knowledge would be essential for the investigation of adiponectin as a potential therapeutic target in periodontal disease.

Aim: To evaluate trimer, hexamer and multimer adiponectin isoform concentrations in the saliva of patients with periodontitis as potential biomarkers and therapeutic targets for periodontal disease.

Methods: Saliva samples will be collected from patients with periodontal health, mild periodontitis and advanced periodontitis, pre- and post-treatment. Total adiponectin and adiponectin isoform concentrations will be analysed with adiponectin multimeric ELISAs.

Outcomes: The study will provide key information relating to the role of this important adipokine in periodontal pathogenesis as well as providing fundamental knowledge relating to adiponectin isoforms. I will use the data from this study to support a post-doctoral fellowship grant application to the UK NIHR to further study the role of adipokines in periodontal inflammation.