Non-surgical periodontal therapy plus short-term antibiotic treatment may improve clinical disease activity: a pilot study in difficult to treat rheumatoid arthritis

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Background/Purpose: Autoimmunity against citrullinated peptides is a hallmark of rheumatoid arthritis (RA). Chronic periodontitis (CP) is a known major source of citrullinated peptides. Here, we investigated potential associations between the treatment of CP, the reduction pathogenic periodontal microbes, the autoantibody repertoire and RA disease activity.
Methods: We evaluated ten patients with DAS28>=4.2 for the presence and severity of CP. All patients had active disease and were positive for rheumatoid factor and anti-cyclic citrullinated peptide antibody (ACPA). Each had an inadequate response to at least two conventional and two biological disease modifying anti-rheumatic drugs. Periodontal scaling and root planing (SRP) was performed in conjunction with one week of amoxicillin and metronidazole therapy, if significant CP was indicated by clinical attachment level (CAL) loss ≥5mm at ≥2 separate sites.

The primary outcome was mean DAS28 improvement >1.2 from baseline to month 3, corresponding to good clinical response. Secondary clinical outcomes included periodontal pocket depth (PD), CAL, and bleeding on probing (BOP). The presence of major periodontal pathogens was assessed by semiquantitative polymerase chain reaction in the subgingival biofilm at baseline, month 3 and 6. Sera were longitudinally tested for antibodies against native and citrullinated peptides from enolase, fibrinogen, vimentin, and tenascin-C.

Results: Eight patients had CP requiring treatment. In these atients, DAS28 improved upon SRP by mean (+/- SD) 0.74 +/- 0.93, p=0.049, thereby failing the predefined significance at a group level. Nevertheless, moderate and transient DAS28 response >0.6 at month three was achieved in (Erratum: four) patients, and prolonged good clinical response was observed in a (Eratum: fifth patient at month 3 and 6. The clinical signs of CP improved in parallel, PD by 1.8 +/- 1.5 mm (mean+/-SD), p=0.018, CAL by 0.7 +/- 0.6 mm, p=0.051, and BOP by 36 +/- 24%, p=0.018. Furthermore, the microbial burden was significantly reduced upon SRP in the biofilm for the following bacteria: P. gingivalis, Treponema denticola and Tannerella forsythia, p<0.05 for all. However, the serum concentrations of all tested autoantibodies remained unchanged at group level, and the changes in the microbiota and titers of autoantibodies could not specifically be associated with improvement of arthritis symptoms in individual patients.

Conclusion: Successful treatment of CP reduced the burden of specific microbial species in the periodontal biofilm, and improvement of clinical RA disease activity could be observed in individual patients. This finding could support the hypothesis of RA inflammation being permanently triggered by chronic periodontal infections. However, clinical responses in this small interventional pilot study did not track back to changes in the microbiota or in the antigen specific immune response, suggesting patient improvement is not directly linked to these aspects of disease.