Is Periodontitis and Rheumatoid Arthritis Inter-Related?

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Abstract

There is a growing awareness of the link between periodontal and systemic inflammatory conditions, such as RA. Inflammation plays a key role in the origin of RA, its chronification, and in progression of the disease with soft and hard tissue destruction, in a way similar to the situation seen in patients with chronic periodontitis.

While the existing level of evidence is low, the association may be reflective of common underlying disregulation of inflammatory response in these individuals, and it seems that a decrease in periodontal inflammation in some way influences the level of systemic inflammation, and appears to contribute to clinical improvement of the disease.

Keywords: Rheumatoid arthritis; Periodontitis; Citrullinated protein; Inflammation

Periodontal disease is a multifactorial, complex disease where there is an interplay of host- tissue response and bacterial infection. Any shift of the equilibrium towards the latter, causes periodontal tissue destruction and is characterized by loss of connective tissue attachment. Periodontal disease are not only a threat to dentition, but may also be a threat to general heath. There are reports suggesting increased prevalence of diabetes, atherosclerosis, myocardial infarction, stroke and rheumatic arthritis (RA) in patients with periodontal disease [1,2] There is a growing awareness of the link between periodontal and systemic inflammatory conditions, such as RA and coronary artery disease based on common etiopathogenic

In 2004, a hypothesis of a possible pathogenic connection between periodontitis and RA was proposed, implicating the involvement of the periodontal pathogen P. gingivalis in the pathogenesis of RA, through the process of citrullination. Citrullination is an enzyme-mediated post-translational modification of the amino acid arginine in a protein into the non-standard amino acid citrulline (Figure 1).

Figure 1: Showing bacterial link between periodontitis and RA.

There is no single test that can assess and predict the status of RA and periodontal disease. However, the combination of clinical and laboratory markers give more meaningful measures of disease activity and severity than a single test. Laboratory markers such as levels of rheumatoid factors, prostaglandins, collagen degradation products and C- reactive protein are altered in inflammatory conditions such as periodontitis and RA. Accordingly, a multitude of factors including clinical parameters, immunopathology and microbiology should be considered in order to reach an acceptable diagnosis and predictive ability for both RA and periodontal disease.

Regarding the possible relationship between periodontal treatment and disease activity, it has been suggested that the control of periodontal disease could contribute to lessen infection and periodontal inflammation by adopting preventive measures with good oral hygiene, supragingival and subgingival scaling and root planing. These measures could reduce the clinical activity of RA, with a decrease in the serum levels of certain products derived from the inflammatory process [28] Systematic review indicates that the application of conservative treatments clearly improves the periodontal parameters (bleeding upon probing, pocket depth and attachment loss) in patients with RA and chronic periodontal disease [29] Furthermore, this periodontal improvement was seen to be associated to beneficial effects in relation to other disease assessment parameters such as the

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