

Rheumatoid arthritis: a review and dental care considerations

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ABSTRACT

Rheumatoid arthritis (RA), is a chronic multisystem disease of presumed autoimmune etiology. Medical complications due to RA and its treatment may affect the provision of oral health care. Associated syndromes may contribute to a patient's susceptibility to infections and impaired hemostasis. Therefore oral health care providers need to recognize and identify modifications of dental care based on the medical status of patients with RA. As with many other chronic conditions, early intervention can reduce the severity of the disease. Furthermore, oral health care providers play an important role in the overall care of these patients as it relates to early recognition, as well as control of the disease.

Keywords: Rheumatoid arthritis, autoimmune, dentistry.

Rheumatoid arthritis (RA) is a chronic inflammatory disease characterized by synovial inflammation that results in destruction of joint tissues.¹ Rheumatoid arthritis was first described clinically in 1800 in a doctoral thesis by Landre-Beauvais, a French medical student, who called the condition "primary aethenic gout." Sir Alfred Garrod established the distinction between RA and gout in 1859 and gave the condition its present name.² The classic characteristics of this disease are bilateral and symmetric chronic inflammation of the synovium, a condition known as synovitis. This inflammatory response particularly affects small joints of the upper and lower extremities, and it often leads to the deterioration and eventual destruction of articular cartilage and juxta-articular bone, as well as to an inflammatory process surrounding tendons, all of which frequently result in deformities of the affected joints.

In addition to the typical pattern of inflammation, patients with RA may experience systemic manifestations such as fatigue, loss of appetite, weakness and vague musculoskeletal pain. Successful management of this condition requires a multifaceted and multidisciplinary approach to treatment. Treatment modalities include systemically administered drugs, local injections of corticosteroids, physical therapy, occupational therapy, psychological counseling, patient education and surgical intervention.

PATHOPHYSIOLOGY

The cause of RA is not known, although its etiology appears to be multifactorial and may involve infectious, genetic, endocrine and immunological causes.³ It is believed to be a T lymphocyte-driven disease in which

a sudden influx of T cells into the affected joints is followed by an increased number of macrophages and fibroblasts, drawn by the release of cytokines, particularly interleukin-1, or IL-1, and tumor necrosis factor alpha, or TNF- α . This cytokine release and subsequent migration of cells is thought to be responsible for the chronic inflammation, and characteristic destructive changes in rheumatoid joints. The synovial membrane is the area of the joint infiltrated by the T cells in a rheumatoid attack and is the site of the subsequent immune response. The severity and progression of RA provoked synovitis depends on the local accumulation and activation of cytokine-releasing cells, which appear to regulate the growth, differentiation and activity of other cells involved in inflammatory and immunological reactions in the rheumatoid joint.⁴

The hypertrophied, inflamed synovial tissue that covers and extends into the cartilaginous areas of the joint with fingerlike processes is defined as the pannus. Cytokine release also leads to the proliferation of fibroblasts, synovial cells, increased prostaglandin and matrix degrading protease activity and, ultimately, the resorption of bone.⁵ There are extra-articular manifestations of RA as well, including rheumatoid nodules, rheumatoid vasculitis, interstitial lung disease, pericardial disease, episcleritis and scleritis, Felty's syndrome and Sjögren's syndrome.⁶

DIAGNOSIS

In 1987, the American Rheumatism Association (now the American College of Rheumatology, or ACR) revised the criteria it had set in 1958 to create a better model for the diagnosis of RA. Morning stiffness, arthritis of three

or more joint areas, arthritis of hand joints, symmetric arthritis, rheumatoid nodules, amount of serum rheumatoid factors, radiographic changes are the criteria which should be present to establish a diagnosis for RA.⁷

There are no specific laboratory tests to diagnose RA. Rheumatoid factors—immunoglobulin M, or IgM, antibodies directed against other immunoglobulins—are found in more than two-thirds of adult patients with RA, but they are not specific to RA and are found in patients with a number of other conditions. Additionally, 5 percent of otherwise healthy people have circulating rheumatoid factors.³

TREATMENT

The objective of RA therapies is to restore or at least maintain quality of life by relieving pain, reducing joint inflammation and preventing joint destruction and deformity. To prevent erosive damage by progressive RA, the condition must be diagnosed early and therapy begun promptly, ideally within two months of disease onset. Nonsteroidal anti-inflammatory drugs, or NSAIDs, are the current mainstream "first-line" treatment, although this protocol is now criticized by many physicians who are arguing for more aggressive early treatment of RA. However, while NSAIDs often are effective in controlling symptoms of RA, they do not alter the course of the disease. Corticosteroids, another option, have both anti-inflammatory and immunosuppressive effects.

"Second-line" or disease-modifying antirheumatic drugs, or DMARDs, whose mechanisms of action as a group are predominantly unknown, include gold, sulfasalazine, hydroxychloroquine, D-penicillamine, azathioprine and leflunomide.⁸

Methotrexate has become a popular treatment choice recently because of its immunosuppressive and anti-inflammatory effects. Combinations of methotrexate with other biologic agents have shown some promise.^{9,10}

Surgical intervention is used in cases of unacceptable pain and limitation or loss of function due to severe joint damage. The most successful procedures include arthroplasties and total joint replacements involving the hips, knees and shoulders.³

ORAL MANIFESTATIONS

Most of the patients with RA will exhibit some temporomandibular joint, or TMJ, involvement during the course of the disease. Involvement of the TMJ results from granulomatous involvement of the articular surface of the synovial membrane, which leads to destruction of the underlying bone. Symptoms characteristic of TMJ dysfunction are observed.

Radiographic findings include narrowed joint spaces, flattened condyles, erosions, subchondral sclerosis, cysts and osteoporosis.¹¹ Patients with long standing active RA may have an increased incidence of periodontal disease, including loss of alveolar bone and teeth.¹²⁻¹⁴

This has been a neglected feature of RA. Similarities in host immune response between RA and periodontal disease have been reported, involving reduced cellular and enhanced humoral activity.^{4,15-17}

While a protective influence of NSAIDs on gingivitis and periodontitis has been reported because of their reduction of inflammation and, therefore, of subsequent loss of bone, there is little knowledge regarding the impact of second-line agents on periodontal disease. Patients with secondary Sjögren's syndrome have chronic xerostomia.⁶ This leads to multiple oral problems, including difficulty in swallowing food, difficulty in speaking, oral soreness and burning (which may be due to oral candidiasis), intolerance to spicy foods, and problems in wearing dentures and an increase in caries.³ Long-term use of methotrexate and other antirheumatic agents such as gold, D-penicillamine and NSAIDs can cause stomatitis. Prolonged use of cyclosporine may cause gingival overgrowth.

DENTAL MANAGEMENT

It is essential that the dentist keep himself or herself updated as to the drugs the patient with RA is currently receiving, their possible side effects and interactions with other drugs. The most common adverse effects are involved with NSAIDs. Before prescribing additional NSAIDs, the clinician must assess the RA patient's current medication schedule to avoid toxic levels, especially in patients with a history of renal impairment or peptic ulcers.

GI-protective agents such as the prostaglandin analog misoprostol may help alleviate these side effects. With long-term glucocorticosteroid use, secondary adrenal insufficiency is a potential problem. Replacement therapy for adrenally suppressed people may be necessary to prevent cardiovascular collapse, as their response to surgical stress may include a precipitous drop in blood pressure. In such cases, an intramuscular or intravenous injection of hydrocortisone may be necessary.

It is recommended that patients with severe RA who have had joints surgically replaced with prosthetic joints may require prophylactic antibiotic therapy before invasive dental procedures. Patients with RA who have upper-airway obstruction resulting from TMJ dysfunction may pose difficulty in intubation. The patient

may require a soft diet restriction.¹⁸ Patients with Sjögren's syndrome may require additional personal oral care instruction, dietary instruction and modifications, home/clinical fluoride therapy, home/clinical chlorhexidine therapy, treatment for their xerostomia, more frequent recall visits and radiographs and more conservative treatment plans.¹⁸

The dentist should be conscious of the patient's physical comfort level in the dental chair: altering the chair's position, allowing the patient to shift positions, using pillows and other such aids, and scheduling shorter appointments all should be considered. Home oral hygiene procedures may present a challenge to the patient with RA because of reduced manual dexterity.

However, it is important to assess the status of the patient's condition carefully, as even mild cases of RA may adversely affect the patient's ability to maintain good oral hygiene, especially in patients with xerostomia. Associated syndromes may contribute to a patient's susceptibility to infections and impaired hemostasis. A proper review of the patient's medication history will allow for more accurate differential diagnoses of oral lesions and will minimize complications with drug interactions or overdoses. Conditions, early intervention can reduce the severity of the disease. Thus, dental healthcare workers play an important role in recognizing signs and symptoms of RA and in advising patients to seek medical care.

REFERENCES

- De Pablo P, Dietrich T, McAlindon T. Association of periodontal disease and tooth loss with rheumatoid arthritis in the US population. *J Rheumatol* 2008; 35: 70-6.
- Short CL. The antiquity of rheumatoid arthritis. *Arthritis Rheum* 1974; 17: 193-205.
- Lipsky PE. Rheumatoid arthritis. In: Wilson JD, Braunwald E, Isselbacher KJ *et al.*, eds. Harrison's principles of internal medicine. 14th ed. New York: McGraw-Hill; 1998: 1880-8.
- Martinez-Martinez RE, Abud-Mendoza C, Patino-Marin N, Rizo-Rodriguez JC, Little JW, Loyola-Rodriguez JP. Detection of periodontal bacterial DNA in serum and synovial fluid in refractory rheumatoid arthritis patients. *J Clin Periodontol* 2009; 36: 1004-10.
- Lorenzo JA. The role of cytokines in the regulation of local bone resorption. *Crit Rev Immunol* 1991; 11: 195-213.
- Kuru B, McCullough MJ, Yilmaz S, Porter SR: Clinical and microbiological studies of periodontal disease in Sjögren's syndrome patients. *J Clin Periodontol* 2002; 29: 92-102.
- Arnett FC, Edworthy SM, Bloch DA, *et al.* The American Rheumatism Association 1987 revised criteria for the classification of rheumatoid arthritis. *Arthritis Rheum* 1988; 31: 315-24.
- American College of Rheumatology Ad Hoc Committee on Clinical Guidelines. Guidelines for the management of rheumatoid arthritis. *Arthritis Rheum* 1996; 39: 713-22.
- Cohen S, Hurd E, Cush J *et al.* Treatment of rheumatoid arthritis with anakinra, a recombinant human interleukin-1 receptor antagonist, in combination with methotrexate: results of a twenty-four-week, multicenter, randomized, double-blind, placebo-controlled trial. *Arthritis Rheum* 2002; 46: 614-24.
- Cohen SB, Emery P, Greenwald MW *et al.* Rituximab for rheumatoid arthritis refractory to anti-tumor necrosis factor therapy: Results of a multicenter, randomized, double-blind, placebo-controlled, phase III trial evaluating primary efficacy and safety at twenty-four weeks. *Arthritis Rheum* 2006; 54: 2793-806.
- Goupille P, Fouquet B, Goga D, Cotty P, Valat J. The temporomandibular joint in rheumatoid arthritis: correlations between clinical and tomographic features. *J Dent* 1993; 21: 141-6.
- Bartold PM, Marshall RI, Haynes DR. Periodontitis and rheumatoid arthritis: a review. *J Periodontol* 2005; 76, 2066-74.
- Berthelot JM, Le Goff B. Rheumatoid arthritis and periodontal disease. *Joint Bone Spine* 2010; 77: 537-41.
- Mikulsk TR, Payne JB, Reinhardt RA *et al.* Antibody responses to Porphyromonas gingivalis (P. gingivalis) in subjects with rheumatoid arthritis and periodontitis. *Int'l Immunopharmacol* 2009; 9: 38-42.
- Mercado FB, Marshall RI, Klestov AC, Bartold PM. Relationship between rheumatoid arthritis and periodontitis. *Periodontol* 2001; 72; 6, 779-87.
- Mercado FB, Marshall RI, Bartold PM: Inter-relationships between rheumatoid arthritis and periodontal disease. *J Clin Periodontol* 2003; 30: 761-72.
- Liao F, Li Z, Wang Y, Shi B, Gong Z, Cheng X. Porphyromonas gingivalis may play an important role in the pathogenesis of periodontitis-associated rheumatoid arthritis. *Medical Hypotheses* 2009; 72: 732-5.
- Joanne C. Fletcher. The Role of Inflammation in Periodontal Disease and Rheumatoid Arthritis: Similar Pathologies. *Access* 2008; 32-5.