

LETTER TO THE EDITOR

MANAGEMENT OF BIOFILM CONTROL IN AN ELDERLY PATIENT SUFFERING FROM RHEUMATOID ARTHRITIS: A CASE REPORTG.M. NARDI¹, S. SABATINI¹, D. LAURITANO², C. DENISI³ and F.R. GRASSI⁴

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Received November 13, 2013 – Accepted November 5, 2013

The increase in the average age of the population forces dentists and dental hygienists to deal with clinical scenarios typical of the elderly. In old people deep changes present both in systemic and oral health. These changes affect the anatomical and functional integrity of many tissues, such as the mouth. Impairment of patients' oral hygiene becomes manifested by local infections and promotes the pathogenesis of periodontal diseases. There is also a significant increase in autoimmune diseases, which are defined as disorders of the immune system that result in abnormal immune responses. Among the autoimmune diseases of medical interest we report a case of rheumatoid arthritis (RA) strictly related to periodontal disease.

An aging population increases the possibilities of visiting patients with particular clinical pathologies associated to advanced periodontitis and impairment of health. Moreover, in these patients there is an increase of incidence of autoimmune diseases, characterized by an alteration of the immune system that acts against different components of the body (autoimmune) and responsible for anatomical and functional alterations. Over the years the focus has been placed on the correlation between periodontal disease and rheumatoid arthritis (RA). RA is a systemic autoimmune disease of unknown etiology that affects 0.5-1% of the world's adult population in which chronic inflammation of the synovial joints and erosion of the bone result in joint destruction, pain, disability and reduced life expectancy (1).

Studies have shown that patients suffering from RA have more possibilities to express mild to se-

vere periodontal disease (PD) compared to healthy subjects. In addition, other studies have found a four-fold higher incidence of RA in patients with periodontal disease (2). Riberio et al. subsequently demonstrated that the treatment of PD led to reduction of the erythrocyte sedimentation rate (ESR) and a tendency towards the improvement of other clinical indices of RA.

The term rheumatoid arthritis was coined for the first time in 1876 by Sir Alfred Baring Garrod. RA is characterized by a 'progressive inflammation and erosion of cartilage and bone tissue, showing a clinical synovitis with fibrous deposition and cartilage damage, erosion of subchondral bone and periosteal tissue inflammation.

RA has a prevalence in Italy and Europe between 0.5-2% in subjects over 15 years of age, with a frequency two- to four-fold higher in females. The ra-

Key words: rheumatoid arthritis, elderly people, biofilm control

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tio is in the range of 0.1 to 0.2 new cases per 1,000 inhabitants for males and between 0.2 to 0.4 for females. The disease is present in all ages, with a peak incidence in young adults and in premenopausal women.

The trigger mechanism of autoimmunity seems related to citrullinated proteins. The citrullination, i.e. the conversion of amino-acid arginine to citrulline, involves the reduction of the net charge of the protein and the loss of a positive charge. This results in a change in the antigenicity potential for exposure of new epitopes to the immune system. This is due to the key role of arginine in the three-dimensional organization of proteins and in ionic interaction with other molecules. The reaction of citrullination is catalyzed by a family of enzymes called calcium-dependent Peptidyl-Arginine Deaminase (PAD) (3). This class of enzymes is the keystone for the correlation of periodontal disease with rheumatoid arthritis. In fact, among the species of prokaryotes, the activity of PAD has been described only in *Porphyromonas gingivalis* (4), a Gram-negative bacterium that plays an important role in the progression of chronic periodontitis.

Many studies have reported an association between periodontitis and rheumatoid arthritis. In fact, patients with PD show higher prevalence of RA compared with patients without PD (5). In another study it was observed that patients with RA have a higher prevalence of periodontitis and edentulism compared to healthy subjects (16% vs 10%). In addition, patients with RA demonstrate a greater frequency of missing teeth but a lower frequency of fillings or cavities (6).

Recently it has been shown that *P. gingivalis* is able to invade human primary chondrocytes and alters the cell cycle, producing a delay in the progression of the cell cycle and an increase in the level of Caspase-3, which results in cell apoptosis activation (7).

Therefore it is easy to explain why this bacterium has been proposed as a primary environmental risk factor for the development of RA. Other recognized environmental factors are cigarette smoke, (identified as risk factor in 1987) and the use of oral contraceptives.

The presence of this autoimmune condition added to aging leads to difficulties in daily life, due

to the different clinical symptoms. Firstly, there is xerostomia in a framework of Sjogren Syndrome secondary to rheumatic disease. The salivary gland dysfunction seems to be caused by a progressive lymphocytic infiltration of the salivary glands, with subsequent inflammatory reaction that causes acinar atrophy and proliferation of connective tissue. The common symptoms are: dry mouth, sore mouth, increased thirst, loss of taste, difficulty in swallowing, chewing and talking, mouth breathing, bad taste and odor, increased sensitivity of teeth, gastroesophageal reflux and malfunctions of prosthesis (8, 9). In addition, because of the immunological and microbiological changes in the oral cavity due to the lack of production of saliva, it is possible to observe an oral candidiasis (10).

RA can also affect the temporomandibular joint, causing pain in jaw movements, such as difficulty in opening the mouth and chewing problems.

In case of involvement of the hands, the clinical picture is characterized by rheumatic polymyalgia affecting the hand that causes great difficulties in daily activities. In fact, patients experience problems in using a key, opening a jar, driving or using public transport. Due to the deformities, patients also have problems in fulfilling daily oral hygiene and consequently have the following clinical features: inflammation of periodontal tissues, edema and bleeding on probing, clinical attachment loss, furcation involvement and teeth mobility. Furthermore, due to xerostomia we find: higher incidence of caries, candidiasis, poor stability of removable prosthesis and halitosis (11).

It is therefore important that patients suffering from RA pay greater attention to daily oral hygiene and to periodical checks, even in case of problems affecting the temporomandibular joint, when an eventual intervention of dentists becomes more complicated due to difficulties in opening the mouth.

Case report

A seventy-year-old Caucasian woman, suffering from RA, came to our attention complaining of dry mouth and the classic signs of periodontal disease and perimplantitis: oral biofilm, inflammation of periodontal and perimplantar tissues, edema and bleeding on probing, clinical attachment loss, furcation involvement and tooth mobility caused by diffi-

culty in performing routine oral hygiene procedures. Halitosis was also detectable.

Oral hygiene instructions

Firstly we provided home maintenance hygiene instructions. Due to the inability to perform effective techniques for manual plaque removal, we recommended the use of an oscillating-rotating battery-powered toothbrush or a manual toothbrush with medium bristles with special handles fitting the hand of patients suffering from RA (TePe® Extra Grip), and in both cases we suggested brushing twice a day for at least two minutes with fluoride toothpaste. For the interproximal biofilm removal we demonstrated the use of an electric flosser that simplifies the use of dental floss (Colibri Oral B®) providing an easier utilization, even with only one hand. In addition to these daily oral hygiene procedures, we suggested the use of chlorhexidine gauzes (Micerium®) once a day after brushing for one week per month, to prevent inflammation. To reduce xerostomia, salivary substitutes were prescribed. To prevent caries, we recommended remineralizing hard tissues with applications of casein mousse or calcium hydroxide and fluoride mousse once a day (in the evening before going bed) after brushing with fluoride toothpaste.

To be sure of the patient's compliance and adherence to the protocol, we used an intraoral camera that allowed to enlarge pictures, which is very helpful in elderly patients with poor vision, and a fluoresceine plaque detector. We also stressed the importance of following a correct home maintenance protocol to prevent soft and hard oral tissue pathologies in order to avoid frequent outpatient dental visits, that could be difficult and annoying for a patient who is not able to open and keep open the mouth for a long time.

Professional therapy.

We performed a screening for oral mucosal lesions, frequently observed in elderly patients, with Velscope VX (Mectron®). Velscope VX allows to discover oral lesions using the fluorescence of the tissues, and allows to observe a lesion before becoming visible with a normal oral examination, enabling an intervention in the early stages of the disease.

We then proceeded with a session of professional oral hygiene. After air-abrasions with glycine pow-

der in order to remove plaque and discoloration, we put Hybenix® in the gingival sulcus and periodontal pockets to dehydrate and dry calculus to facilitate its removal with ultrasonic instruments. We used appropriate ultrasonic tips to remove supra and subgingival calculus. Where peri-implant pockets were detected we did manual scaling with teflon curettes. After scaling and root planning, we applied the photodynamic therapy with Laser HELBO® in all the periodontal pockets, to improve healing, providing a further disinfection of the pockets. To remineralize hard tissues we applied fluoride varnish and calcium hydroxide and fluoride mousse.

In addition, in accordance with the patient, we planned a professional bleaching for the next appointment and the following month the patient received her bleaching. No clinical signs of inflammation were detectable a week after the treatment and after a month when the patient came to receive the professional bleaching. The home maintenance protocol was able to support healing after the professional therapy.

DISCUSSION

In elderly patients who show typical symptoms of RA, infection control of the periodontal tissues improves the systemic condition in many cases. In contrast, neglecting oral hygiene, rheumatoid arthritis may be affected in a negative way and show a worsening of systemic symptoms and signs.

Geriatric patients, in contemporary society, are more aware of the importance of oral health and its effects on quality of life. In order to obtain good level of oral health for a long time, older people require more dental care. The establishment of an appropriate treatment plan related to the severity of RA is an easy task. The dental and periodontal treatment should be directed towards the extraction of dental elements that cannot be recovered and the maintenance of residual teeth with correct prevention programs followed by dentists and dental hygienists. In order to maintain the dignity and quality of life of RA patients, dental treatment should be aimed at the creation of stable oral conditions to minimize the level of inflammation within the oral cavity of the patient during the last stages of the disease, when performing treatment protocols may become impos-

sible.

Good oral hygiene is of great importance in elderly patients (12), particularly in those patients with local (13, 14) or systemic diseases (15-18). Instruction and reinforcement of oral hygiene, in particular with use of chlorhexidine (19), and special ultrasonic instruments (20), along with frequent dental assessment and care by the dentist are essential measures to preserve the oral health of those affected by AR.

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