

Maxillary Osteonecrosis Associated with the Use of Bisphosphonates

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Bisphosphonates (BFs) have been indicated for the treatment of diseases of bone metabolism. Currently, its therapeutic use has increased, and with it, side effects, which one of the most important is the induction of osteoporosis of the jaw, a complication with difficult treatment and solution. Until the present moment, the mechanism of development of bisphosphonate-induced maxillary osteonecrosis (ONMB) is uncertain, nor what treatment should be established before this manifestation. Although the literature presents varied forms of treatment, there is no defined protocol.

Bisphosphonates (BFs) have been used since 1960 for the treatment of bone metastases, lung cancer, multiple myeloma, Paget disease, calcium metabolism disease control, among others. Its therapeutic use is predominant for the treatment and prevention of osteoporosis and osteopenia.

BFs alter the mechanism of bone resorption and remodeling, and, therefore, would have therapeutic action in the diseases mentioned above. With the increase in the use of BFs and the increase in the time of use of these drugs, the first reports of complications associated to its use appeared, of which the most common are in relation to myalgia and esophagitis. Bisphosphonate-induced osteonecrosis in the jaw (ONMB) was first reported in 2003, when 36 mandibular and/or maxillary bone lesions were demonstrated in patients using pamidronate or zoledronate, describing the lesions as resulting from a known severe adverse effect.

Since then, ONMB has been recognized as an entity with a significant impact on the quality of life of patients using this drug. The variety of clinical signs and symptoms of ONMB, preventive measures, the effects of discontinuation of BFs, as well as the prognostic indicators and etiology of this disease remain undefined. In addition, the effectiveness and efficiency of treatment for ONMB have not been adequately characterized.

Treatment and prevention

The most frequently found microorganisms in the exposed bones are *Actinomyces*, *Veillonella*, *Eikenella*, *Moraxella*, *Fusobacterium*, *Bacillus*, *Staphylococcus*, *Streptococcus* and *Selenomonas* species. All these microorganisms are sensitive to penicillin, so this is the drug of choice for non-surgical treatment of the disease.

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The main objective of the preventive action for the patients that present risk or treatment for those who have already developed the ONMB is the preservation of the quality of life, controlling the pain, the infection and preventing the development of new areas of necrosis. The risk is associated with the accumulation of the drug, which occurred during years of treatment. Patients should receive careful dental evaluation, including radiographic examinations, and guidance on the possibility of development of ONMB.

When there is a need for some surgical procedure, some authors suggest that individuals sign a risk science term agreeing to the treatment. The emphasis for the treatment of patients receiving intravenous BFs is to reduce the risk of ONMB, minimizing the need for surgical procedures. In such cases, patients should be very well informed about the care required to maintain oral health and about the methods of hygiene, and should be evaluated clinically and radiographically, preferably before starting pharmacological therapy. Dental treatment that includes restorations, endodontic treatment or surgical procedures should be performed prior to initiation of therapy with BFs.

The communication of the doctor who prescribes the medication with the patient's dental surgeon is essential to try to establish a preventive treatment for ONMB before the start of the drug therapy. Experimental *in vitro*, *in vivo*, and clinical studies are needed to better understand the development of ONMB. Results of future research may contribute to the design of adequate prevention and treatment protocols for patients.

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