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Effects of mini screw placement in mandibular bone of rats treated with low dose zoledronate

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Bisphosphonates are a category of drugs that are commonly used in dentistry and orthopedics to treatment of several bone disorders. The two most potent and widely used nitrogen-containing BPs are zoledronate and alendronate, which inhibit the intracellular mevalonate pathway. In recent years it has been observed Biphosphonate-associated osteonecrosis of the jaws which is a real complication of intravenous biphosphonates therapy in patients with cancer or osteoporosis. In our previous studies, performed on rat model, we observed mandibular bone characteristics after long term of low dose zoledronate treatment without tooth extraction or trauma; results showed several areas of bone with empty osteocyte lacunae, absence of matrix and presence of unorganized fibrillar structures but no spontaneous bone exposure has been observed. In the present study we have treated 20 rats with intraperitoneal injections of zoledronate at the lower dose for three times a week. After 30 days of treatment we applied trauma on mandibular bone by application of screw. Specimens were analysed by histological staining, immunofluorescence techniques and scanning electron microscopy. Our results show that the bone area of screw application is characterized of empty osteocyte lacunae, empty Volkmann'and Havers'canals and some inflammatory cells. Although the presence of small necrotic areas no bone exposure has been observed after low dose zoledronate treatment and trauma application. These results suggest us that the bisphosphonates-associated osteonecrosis of jaw is strictly correlated to drug's dose. It will be necessary to perform the same study using the highest dose of drugs.

References

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Keywords
Biphosphonates, mandibular bone, BRONJ