Immunohistochemical characterization on of an experimental model of drug - Associated osteonecrosis of the jaw in rats

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DOI: 10.22592/ode2023nesp1e605

Resume

Objectives. Currently, there is no effective treatment for medication-related osteonecrosis of the jaw (MRONJ). The aim of this study is to characterize an experimental model of MRONJ in rats as a tool to evaluate the protective effects of melatonin in this pathology.

Methods. Female Wistar rats (n=8) were randomly assigned to 2 groups: the AZ group (n=6) received an intraperitoneal injection of Zoledronic Acid (50µg/kg body weight) weekly for 60 days. The CT group (n=2) received physiological solution. Thirty days after treatment, both groups had their first lower molar extracted. After euthanasia, the jaws were dissected, histologically processed and the samples were mounted on positive glass for immunohistochemistry (IHC) against the receptor activator of nuclear factor-κB ligand (RANKL) and osteoprotegerin (OPG).

Results. IHC analysis showed the following indexes: OPG-CT=15.45±0.40, OPG-AZ=9.41±1.21; RANKL-CT=11.24± 3.46 RANKL-AZ=3.99 ±1.73. A significant decrease in OPG and RANKL expression was observed in AZ group with respect to the control group ($p<0.05$), which would mean that there is a slowing of bone remodeling that are in agreement with the histomorphometric and radiological results previously found.

Conclusions. These results showed that AZ administration can cause a delay in repair and changes in bone architecture. This model reproduced an experimental osteonecrosis useful to evaluate new therapeutic options, such as the application of melatonin, in further studies.

Key words. Osteonecrosis - bone remodeling - bisphosphonates

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