1-P-083

Poster Sessions

Bone anabolic effects of MPMBP, a non-nitrogen-containing bisphosphonate, in young rats

Keiko Suzuki¹, Masahiro Nagaoka¹, Hisashi Shinoda²

¹*Div. Dent. Pharmacol., Ohu Univ. Sch. of Dent.*, ²*Ctr. for Environ. Dent., Tohoku Univ. Grad. Sch. of Dent.*

Disodium dihydrogen-4-[(methylthio) phenylthio] methanebisphosphonate (MPMBP) is a novel, non-nitrogen-containing BP with an antioxidant side chain. In this study, we compared the effects of MPMBP with those of zoledronate on bone remodeling in rats. MPMBP or zoledronate was subcutaneously injected every three days in neonatal or growing rats. The animals were euthanized after sequential labeling with tetracycline and calcein, and their tibias, femurs, jaw bones were harvested and examined. Bone morphometric analyses revealed that MPMBP increased the bone mass of the distal femur and proximal tibia. The zoledronate-treated neonatal rats showed reduced weight gain, suppression of longitudinal growth in the hind limbs, and a marked delay in tooth eruption, whereas the MPMBP-treated rats showed normal weight gain and eruption of teeth at the appropriate developmental stage. Further, the MPMBP-treated rats showed higher fluorescence intensity of calcein in their trabeculae, revealing that new mineralization occurred following treatment with MPMBP. In conclusion, our results show that MPMBP has a potent anabolic effect on bones, whereas zoledronate has severe adverse effects due to excessive inhibition of bone resorption and/or bone remodeling.