Effects of standard heparin and low-molecular-weight heparins on the formation of murine osteoclasts in vitro

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Abstract:
Long-term administration of heparin can lead to development of osteoporosis. The aim of the present study was to examine the effects of standard heparin and low-molecular-weight heparins (nadroparin, enoxaparin, parnaparin and dalteparin) on osteoclast formation from neonatal murine bone marrow cells stimulated by 1,25-dihydroxyvitamin D₃ in vitro. Standard heparin (0.1–10 IU/ml) and low-molecular-weight heparins (1–100 anti-Xa IU/ml) affected the formation of osteoclasts in two directions. In the rat bone marrow cell cultures, at lower concentrations, the heparins tended to increase the formation of osteoclasts, whereas at the highest concentrations (10 IU/ml and 100 anti-Xa IU/ml, respectively) they tended to decrease the number of osteoclasts. In the mouse bone marrow cell culture, the heparins suppressed the formation of osteoclasts, with the exception of standard heparin at 0.1 IU/ml which intensified the process. Results of the present study indicate species differences in the sensitivity of bone marrow cells to standard heparin and low-molecular-weight heparins.

Key words:
osteoclasts, heparin, low-molecular-weight heparins