Effects of risedronate in a rat model of osteopenia due to orchidectomy and disuse: Densitometric, histomorphometric and microtomographic studies

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Mots-clés	Bone histomorphometry [7], Disuse [8], DXA [9], MicroCT [10], Orchidectomy [11], osteoporosis [12], Risedronate [13]
Résumé en anglais	Dual energy X-ray absorptiometry (DXA), histomorphometry and X-ray microtomography (microCT) were used to assess effects of risedronate and testosterone in a combined rat model of orchidectomy (ORX) and local paralysis induced by botulinum neurotoxin (BTX). Four groups of mature rats were studied for 1 month: SHAM operated; ORX and right hindlimb immobilization (BTX); ORX + BTX + risedronate or testosterone. Changes in bone and body composition were measured by DXA (BMC, lean and fat mass), histomorphometry (BV/TV2D, Tb.Th and microarchitectural parameters) and microCT (BV/TV3D, SMI and cortical parameters). ORX and BTX had additive effects on bone loss since differences were maximized on the immobilized bone. The decrease in BMC on the tibial metaphysis reached −33.6% vs. −11.3% in the non-immobilized limb. BV/TV and Tb.N decreased and Tb.Sp increased in both hindlimbs whereas Tb.Th was significantly lower only in the immobilized limb. Decrease of tibial cortical area and thickness was greater in the immobilized limb. Risedronate prevented BMC, BV/TV and architecture loss but not reduction in Tb.Th. Cortical bone was preserved only in the non-immobilized limb. Testosterone was unable to prevent trabecular and cortical bone loss, but it prevents loss of whole body lean mass. In conclusion, ORX and BTX resulted in additive effects on bone loss. Risedronate had protective effects on trabecular bone loss but was less effective on cortical bone.
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