Format: Abstract

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[Therapeutic effect of dietary boron supplement on retinoic acid-induced osteoporosis in rats].

[Article in Chinese]

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Abstract

OBJECTIVE: To observe the therapeutic efficacy of dietary boron supplement on retinoic acid-induced osteoporosis in rats, so as to provide experimental evidence for clinical management of osteoporosis with boron.

METHODS: Thirty-two SD rats were randomized into normal control group (8 rats) and osteoporotic group (24 rats), and osteoporosis was induced in rats of the latter group by intragastric retinoic acid administration at the daily dose of 80 mg/kg for 15 consecutive days. The osteoporotic rats were subdivided into control group (8 rats) without treatment, boron treatment group (8 rats) and estradiol treatment group (8 rats). After 30 days of treatment, the serum contents of Ca, P, boron and the activities of alkaline phosphatase (AKP) and tartrate-resistant acid phosphatase (TRAP) in the rats were assayed, the bone mineral density (BMD) of the whole body, lumbar vertebrae and tibia were determined, and the morphological changes of the femurs were observed.

RESULTS: The serum contents of Ca and P in the rats of the 4 groups differed scarcely, but the content of boron in boron treatment group was markedly higher than that in the other three groups. In the osteoporotic control group, the activities of serum AKP and TRAP, the masses of spongy bone and cortical bone of the femurs, and the quantity of the osteoclasts were increased, with the BMD of the lumbar vertebrae and tibia decreased, suggesting osteoporotic conditions. The mean trabecular plate density and thickness, trabecular bone volume and cortical bone volume of the femurs in the osteoporotic rats treated with boron or estradiol were significantly increased, but the active osteoclast quantity in the spongy bone and serum TRAP activities were obviously decreased, and the bone quality was comparable with that of the normal group. In addition, the serum AKP activity and the active osteoblast quantity in the spongy bone were obviously increased in boron treatment group.

CONCLUSION: The dietary boron supplement can increase the serum content of boron of osteoporotic rats to stimulate bone formation and inhibit bone resorption, producing therefore obvious therapeutical effect against osteoporosis.

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