

Resistance Running Exercise Effectively Prevents Bone Loss in Ovariectomized Rats

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Abstract

In the present study, we examined effects of difference of endurance and resistance running on bone mineral density of ovariectomized SD rats. Thirty 12wk-old female SD rats were assigned to four groups: 1) sham operated (Sham); 2) ovariectomized (OVX); 3) OVX endurance exercised (OEN); 4) OVX resistance running exercised (ORE). All rats were fed a low Ca (0.1%) diet ad libitum. Endurance exercising rats were forced to run 40 minutes on a uphill (7%) treadmill at 21m/min. Resistance running exercising rats were forced to take 40 sets of 1 min run interspersed with 1min rest with a 100g weight on the back on a uphill (11%) treadmill at 21 m/min. The experimental duration consisted of the 2 weeks adaptation periods and 4 weeks treatment periods. The bone mineral density (BMD) of femur, tibia and fourth lumbar vertebrae (L4) in OVX, assessed by DEXA (Lunar) and tibial trabecular volumetric BMD assessed by pQCT (Stratec) were obviously reduced ($p<0.01$) than Sham rats. Resistance running exercise significantly prevented the bone loss caused by ovariectomy in ORE rats. Urinary excretion of deoxypyridinoline-adjusted creatinine (DPD) in OVX significantly increased compared with Sham ($p<0.05$). Although DPD of OEN significantly higher than Sham, that of ORE tended to lower than OVX,. These results suggested the possibility that suitable resistance running exercise have more beneficial effects than endurance exercise on alleviating bone loss of ovariectomized rats and this preventing effects of bone loss were caused by suppress of bone resorption.

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