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口服蛇床子素提高大鼠峰值骨量的研究

Study the Inprovement of Peak Bone Mineral Density and Bone Quality of Rats by Osthole

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中文摘要:

目的 研究口服蛇床子素是否能提高大鼠峰值骨量，从而预防骨质疏松症。方法 1月龄健康SD♀大鼠随机分为2组，每组12只。给药组每日灌服10 mg·kg^{-1}蛇床子素，对照组灌服等体积蒸馏水。每周监测体质量，每月检测1次全身骨密度。3个月后处死所有动物，取血测血清骨钙素(OC)和抗酒石酸性磷酸酶5b(TRACP 5b)含量，取双侧股骨和胫骨分别进行骨密度检测、分析，骨形态计量分析和生物力学评价，剥离心、肝、胃、肾、肾上腺和子宫后称重，计算器官指数，并做常规病理学检测。结果 2组大鼠的体质量始终无显著性差异(P>0.05)；各器官指数均无明显差异(P>0.05)，病理学观察未见异常发生；第1、2月的全身骨密度无明显差别(P>0.05)，但3个月后给药组显著高于对照组，股骨骨密度呈相同趋势(P<0.05)；给药组的血清OC水平升高，而TRACP 5b含量下降(P<0.05)；μCT检测结果是：给药组的骨体积百分率、骨小梁厚度和骨小梁数量均高于对照组，但骨小梁分离度和模型系数均显著低于对照组(P<0.05)；股骨最大载荷(P<0.01)、屈服强度(P<0.01)和弹性模量(P<0.05)均为给药组明显高于对照组。结论 口服蛇床子素可抑制实验大鼠体内骨吸收水平并增强骨形成，提高大鼠峰值骨量，可预防各种原因引起的骨质疏松及骨质疏松性骨折。

英文摘要:

OBJECTIVE To investigate the effects of osthole on peak bone mass of rats. METHODS Twenty-four one-month SD rats were randomly divided into two groups, one group was orally administrated osthole at 10 mg·kg^{-1} and the other was given equal volume of distilled water and used as the control. The body weight was monitored every week and the bone mineral density(BMD) of total body was measured every month. All rats were sacrificed after three months. The femoral bone mineral density, the serum levels of osteocalcin(OC) and anti-tartaric acid phosphatase 5b (TRACP 5b) were measured. The bone microarchitecture was analyzed with μCT and the bone biomechanics properties were tested with universal material machine. RESULTS No significant differences were observed between osthole-treated group and the control for the food-intake and body weight during three months. However, the rats treated with osthole had significant higher BMD for both total body and femoral than the control. The osthole-treated rats also had higher level of serum OC and lower level of TRACP 5b. Besides, they owned bigger bone volume/tissue volume, trabecular thickness, trabecular number but smaller trabecular spacing and structural model index. In the three point bending tests of femurs, they were found to have larger maximum load and the young's modulus and yield load. CONCLUSION Orally administered osthole can enhance peak bone mass by improving bone formation and inhibiling bone resorption, and therefore can be used to prevent osteoprosis.