

论著

地塞米松对大鼠腰椎骨质量的影响

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摘要 **目的** 观察地塞米松(Dex)对大鼠腰椎骨质量的影响。**方法** SPF级3月龄SD雌性大鼠, 每周尾静脉注射Dex 1, 2.5及5 mg·kg⁻¹ 2次, 共8周。在实验结束前第14, 13天和第4, 3天分别sc四环素和钙黄绿素荧光标记。实验结束时处死大鼠后取材, 采用不脱钙骨切片和骨组织形态计量学方法观察和测量第4腰椎骨的显微结构参数; 骨密度仪测量第3腰椎的骨矿密度; 采用生物力学方法进行第5腰椎的压缩力学检测。**结果** 与正常对照组相比, 所有Dex组体重明显下降, 分别下降了14.8%, 16.6%和18.0% ($P<0.05$)。骨矿含量和压缩力学检测变化与正常对照组无明显统计学差异。骨小梁数量分别增加了17.2%, 13.3%和9.0%, 分离度分别减小了19.2%, 16.7%和15.1% ($P<0.05$), 但镜下观察看到小梁细碎, 断裂点多且分布不均。动态参数荧光周长百分率明显下降, Dex 1, 2.5和5 mg·kg⁻¹组分别降低49.5%, 62.4%和73.2% ($P<0.01$); 骨形成率分别降低47.0%, 66.8%和76.7% ($P<0.01$); 成骨细胞周长也分别降低了20.0%, 49.3%和43.6% ($P<0.05$, $P<0.01$)。**结论** Dex显著抑制骨形成, 骨代谢的失衡致骨的组织成分改变, 三维结构变差, 但腰椎骨质量还没有明显下降。

关键词 [地塞米松](#) [骨和骨组织](#) [骨密度](#) [骨质疏松](#)

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Effect of dexamethasone on bone quality of the lumbar vertebra in rats

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Abstract

OBJECTIVE To study the effect of dexamethasone(Dex) on bone quality of the lumbar vertebra of rats. **METHODS** SPF SD rats were iv given Dex 1, 2.5 and 5 mg·kg⁻¹, twice a week, for 8 weeks. All rats were sc given tetracycline on the fourteenth and thirteenth day before sacrifice and calcein on the fourth and third day before sacrifice for double labels. The fourth lumbar vertebra (L₄) was collected to process undecalcified sections for bone histomorphometry analysis. The L₃ and L₅ vertebrae were used to test bone mineral content and maximum compressive loading, respectively. **RESULTS** Compared with normal group, body mass of Dex 1, 2.5 and 5 mg·kg⁻¹ groups decreased by 14.8%, 16.6% and 18.0% ($P<0.05$), trabecular bone volume increased 17.2%, 13.3% and 9.0%, respectively, and trabecular separation rate decreased 19.2%, 16.7% and 15.1% ($P<0.05$), respectively. The trabecular bone was fragmentary, discontinuous and unevenly distributed through microscopic observation. The dynamic parameters of the percentage of the labeled perimeter significantly decreased 49.5%, 62.4% and 73.2% in Dex 1, 2.5 and 5 mg·kg⁻¹ groups ($P<0.01$), respectively, and the bone formation rate decreased by 47.0%, 66.8% and 76.7%, respectively ($P<0.01$). Osteoblast perimeter also decreased by 20.0%, 49.3% and 43.6% in Dex 1, 2.5 and 5 mg·kg⁻¹ groups ($P<0.05$), respectively. However, bone mineral content and maximal compressive loading changed little. **CONCLUSION** Dex can significantly inhibits bone formation. Unbalanced bone metabolism leads to changes in the composition of bone and deterioration of three-dimensional structure. However, no significant decline has occurred in the bone quality of the lumbar vertebra.

Key words [dexamethasone](#) [bone and bones](#) [bone mineral content](#) [osteoporosis](#)

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