

基础医学

大鼠创伤性股骨头坏死进程中ATF4与GPR48的表达联控

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摘要:

目的 探讨大鼠创伤性股骨头坏死进程中活性转录因子4(ATF4)与G蛋白偶联受体48(GPR48)的表达方式及其相关性,研究两者在坏死进程中的联控效应。方法 6月龄SD大鼠36只,随机分为实验组(n=24)和对照组(n=12)。实验组采用圆韧带离断结合骨膜翻转术,对照组采用假手术作为对照。术后1、2、4周收集双侧股骨头,采用组织学、免疫组织化学、RT-PCR、Western blotting等方法检测股骨头坏死变化、ATF4动态表达变化及其与GPR48表达的相关性。结果 ①组织学观察显示,股骨头坏死为渐进性发展,实验组1、2周股骨头关节软骨表面略显粗糙,4周时关节软骨出现不同程度的虫蚀样破损;②免疫组化显示,实验组ATF4、GPR48和PCNA表达量在3个不同时间点逐渐增加,但均低于对照组(P<0.05);③ RT-PCR结果显示,ATF4和GPR48在3个不同时间点逐渐增加(P<0.05)。④ Western blotting分析显示,实验组ATF4和GPR48在3个不同时间点逐渐增加,但均低于对照组(P<0.05)。⑤ Pearson相关性分析显示,ATF4与GPR48在不同时间点呈正相关(r=0.659, P<0.01)。结论 创伤性股骨头坏死发展进程中,初期 ATF4和GPR48表达下降,但随坏死进程而逐渐增加,两者表达呈正相关,可能与坏死所伴随的局部修复有关。

关键词: 活性转录因子4; G蛋白偶联受体48; 股骨头缺血坏死; 创伤; 大鼠

Correlation of ATF4 and GPR48 expressions in the progression of traumatic necrosis of the femoral head in rats

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Abstract:

Objective To explore the correlation between ATF4 and GPR48 expressions, which might reflect the correlative regulation effects during the progression of traumatic necrosis of the femoral head in rats. Methods A total of 36 SD rats were divided into two groups: the experimental group (n=24) which were models of traumatic necrosis of the femoral heads operated with Norman's technique, and the control group (n=12) which received sham operation. The femoral heads were collected 1w, 2w and 4w after operation, and then analyzed with histological and immunohistochemical Methods, RT-PCR and Western blotting to observe the progression of necrosis. Results From the 1st to 4th week, the necrosis gradually aggravated. In the 4th week, there were breakages on the articular cartilage with rough surface. Immunohistochemical analysis showed that the expressions of ATF4, GPR48 and PCNA in the experimental group gradually increased, but were significantly lower than those in the sham operation group (P<0.05) at the same time point. RT-PCR Results suggested that mRNA of ATF4 and GPR48 gradually increased with time going. Western blotting displayed that the protein expressions of ATF4 and GPR48 gradually elevated in the experimental group, and ATF4 had a positive correlation with GPR48 (r=0.659, P<0.01). Conclusion In the progression of traumatic necrosis of the femoral head, the expressions of ATF4 and GPR48 decline in the initial stage but may gradually increase. There is a positive correlation between them, which might be associated with the concomitant repair of the necrotic bone.

Keywords: Activating transcriptional factor 4; G-protein coupled receptor 48; Osteonecrosis of the femoral head; Trauma; Rats

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