

基础研究

不同运动负荷对大鼠海马组织NGF和nNOS表达的影响及其意义

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摘要:

目的: 探讨不同运动负荷对大鼠海马组织神经生长因子(NGF)和神经型一氧化氮合酶(nNOS)表达的影响及机制, 为运动干预脑健康及预防脑老化研究奠定基础。方法: 40只Wistar雄性大鼠随机分为不进行运动干预的对照组和每天进行15、30和60 min的小、中、大游泳运动负荷的实验组, 实验8周后取大鼠脑组织, 免疫组织化学S-P法检测大鼠海马组织NGF和nNOS表达水平及形态学表现。结果: 与对照组比较, 小、中、大运动负荷组大鼠海马组织NGF阳性表达水平均明显升高 ($P<0.05, P<0.01$); 与小运动负荷组比较, 中、大运动负荷组大鼠海马组织NGF阳性表达水平升高 ($P<0.01$), 但中等运动负荷组大鼠与大运动负荷组比较差异无统计学意义 ($P>0.05$)。与对照组比较, 中、大运动负荷组大鼠海马组织nNOS阳性表达水平升高 ($P<0.01$); 与小运动负荷组比较, 中、大运动负荷组大鼠海马组织nNOS阳性表达水平升高 ($P<0.05, P<0.01$), 大运动负荷组大鼠海马组织nNOS阳性表达水平高于中运动负荷组 ($P<0.01$)。免疫组织化学染色: 大鼠海马组织NGF阳性神经元主要表达在神经细胞胞浆, 呈棕色; nNOS阳性神经元呈棕褐色, 着色主要位于胞浆。结论: 大鼠海马组织NGF和nNOS的表达水平在一定范围内随着运动负荷的增加而升高, 提示在不同的运动负荷阶段NGF和nNOS对海马神经的生长和损伤的修复具有重要作用。

关键词: 运动负荷; 海马; 神经生长因子; 一氧化氮合酶。

Influence of different exercise load on expression of NGF and nNOS in rat hippocamp tissues and significances

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Abstract:

Abstract: Objective

To explore the influence of different intensities of exercise load on the expressions of nerve growth factor(NGF)and neuronal nitric oxide synthase (n-NOS) in rat hippocamp tissues and mechanism and lay a foundation for study on prevention of brain diseases. Methods 40 Wistar male rats were divided into non-exercise group (control group) and exercise group. In exercise group, the rats swam for 15, 30 and 60 min every day. After 8 weeks, the rat brain was obtained, the expression levels of NGF and n-NOS in rat hippocamp tissues were detected with S-P immunohistochemistry. Results Compared with control group, the positive expression levels of NGF in rat hippocamp tissues in 15, 30, and 60 min groups were significantly increased ($P<0.05, P<0.01$). Compared with 15 min group, the positive expression levels in 30 and 60 min groups were increased ($P<0.01$); but there was no significant difference between 30 min group and 60 min group ($P>0.05$). Compared with control group, the nNOS positive expression levels in rat hippocamp tissues in 30 and 60 min groups were significant increased ($P<0.01$). Compared with 15 min group, the nNOS positive expression levels in rat hippocamp tissues in 30 and 60 min groups were significantly increased ($P<0.05, P<0.01$), and there was significant difference between 30 min group and 60 min group ($P<0.01$). Conclusion The expression levels of NGF and nNOS in rat hippocamp tissues are increased with the increase of exercise load within a certain range. It indicates that the NGF and nNOS in different periods with exercise load have important effects on the growth and repair of hippocampal nerve.

Keywords: exercise load; hippocamp; nerve growth factor; nitric oxide synthase

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