

论文

间歇性低氧对大鼠海马区磷酸化JNK表达影响

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摘要:

目的 探讨间歇性低氧对大鼠海马区磷酸化c-Jun氨基末端激酶(JNK)表达及学习记忆影响。方法 120只雄性SD大鼠随机分成对照组及轻、重度低氧组,对照组暴露于空气中,低氧组分别暴露于不同低氧条件下(100、50 ml/L),暴露时间8 h/d,连续2、4、6、8周,Morris水迷宫检测学习记忆功能,光镜观察海马区神经细胞形态变化,免疫印迹和免疫组化法检测海马区磷酸化JNK表达。结果 与对照组比较,随低氧时间延长,低氧组大鼠海马区脑组织结构损伤,磷酸化JNK表达增多;水迷宫检测动物逃避潜伏期延长、穿越原平台次数减少,与轻度低氧组比较,重度低氧组变化更为明显( $P<0.05$ );轻、重度低氧组暴露后6、8周大鼠海马区磷酸化JNK表达分别为(5.84±1.17)、(3.58±1.0)和(7.86±1.56)、(9.78±3.41),与轻度低氧组比较,重度低氧组大鼠海马区磷酸化JNK表达升高,差异有统计学意义( $t=5.63, P<0.05$ )。结论 间歇性低氧可导致大鼠学习和记忆功能障碍,其机制可能与磷酸化JNK不同时间和强度差异表达有关。

关键词: 低氧 有丝分裂原活化蛋白激酶(MAPKs) 学习 记忆

Effects of intermittent hypoxia on expression of phosphorylated JNK in rats

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Abstract:

Objective To investigate the effects of intermittent hypoxia on phosphorylated JNK expression and learning and memory functions in rats. Methods One hundred and twenty male Sprague-Dawley rats were randomly divided into three groups: control group, mild intermittent hypoxia group, and severe intermittent hypoxia group. The rats in control group were exposed to ambient air and the rats in two intermittent hypoxia groups were exposed to different intermittent hypoxia conditions (100 ml/L and 50 ml/L, 8-hour-intermittent hypoxia a day with the exposure durations of 2, 4, 6, and 8 weeks, respectively). The learning and memory functions were measured with water maze test; the morphological changes were observed with light microscopy; the expression of phosphorylated JNK protein was detected with immunohistochemistry and western-blotting. Results Compared with the control group, the hippocampal brain structure was damaged in intermittent hypoxia rats with the increase of hypoxia time, and the phosphorylated JNK expressions increased obviously. Water maze test showed that escaping latency was prolonged and the number of crossing site was reduced. The changes were more significant in severe intermittent hypoxia group ( $P<0.05$ ). Six and eight weeks after the hypoxia exposure, the phosphorylated JNK expressions in mild intermittent hypoxia group and severe intermittent hypoxia group were 5.84 ± 1.17, 3.58 ± 1.0 and 7.86 ± 1.56, 9.78 ± 3.41, respectively, with significant increase in severe intermittent hypoxia group ( $P<0.05$ ). Conclusion Intermittent hypoxia can cause learning and memory impairments and the effects might be related to the JNK activation induced by different duration and severity of intermittent hypoxia.

Keywords: hypoxia mitogen-activated protein kinases(MAPKs) learning memory

收稿日期 2012-05-06 修回日期 网络版发布日期

DOI: 10.11847/zgggws2013-29-04-20

基金项目:

河北省科技厅资助项目(09276103D-11)

通讯作者: 王红阳

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