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Huang Yuxing,Hu Shengli,Zou Yongjie,et al.Effect of hyperbaric oxygen preconditioning on osteopontin expression in MCAO rats [J].J Third Mil Med Univ,2013,35(01):15-19.

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高压氧预适应对大鼠大脑中动脉闭塞后骨桥蛋白表

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Title: Effect of hyperbaric oxygen preconditioning on osteopontin expression in MCAO rats

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关键词: 高压氧预适应; 大脑中动脉闭塞; 神经保护; 骨桥蛋白

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摘要: 目的 观察高压氧预适应(hyperbaric oxygen preconditioning, HBOP)对大鼠大脑中动脉闭塞(middle cerebral artery occlusion, MCAO)后的神经保护作用并初步探讨其对骨桥蛋白（osteopontin, OPN）表达的影响。 方法 雄性SD大鼠72只,分为假手术组，HBOP+假手术组，单纯MCAO组、HBOP+MCAO组，每组18只。采用大脑中动脉线栓法建立大鼠MCAO模型。于术后12 h取材，观察大鼠神经功能和脑梗死变化情况；HE染色光镜下观察缺血区脑组织的病理形态学改变。Western blot检测缺血区OPN的表达变化。 结果 神经功能缺损评分：术后12 h假手术组及HBOP+假手术组评分均为0分，单纯MCAO组（3.80±0.79）分，HBOP+MCAO组（2.50±0.97）分；平衡能力评分：术后12 h假手术组及HBOP+假手术组大鼠平衡能力评分均为5分，单纯MCAO组（1.50±1.08）分，HBOP+MCAO组（2.70±2.95）分；脑梗死率：术后12 h假手术组及HBOP+假手术组大鼠梗死率均为0，单纯MCAO组（49.22±7.07）%，HBOP+MCAO组（41.96±3.15）%。可见与单纯MCAO组比较，HBOP+MCAO组在术后12 h神经功能缺损评分明显降低($P<0.05$)，平衡能力评分显著提高($P<0.05$)；脑梗死率明显小于单纯MCAO组($P<0.05$)；HE染色见缺血区脑组织病理损伤明显减轻；Western blot检测提示OPN的表达显著增强。 结论 高压氧预适应可以诱导大鼠MCAO后的神经保护作用，其机制可能与HBOP引起的OPN表达增高有关。

Abstract: Objective To observe the neuroprotective effect of hyperbaric oxygen

preconditioning (HBOP) in rats after middle cerebral artery occlusion (MCAO), and to investigate the effect on osteopontin (OPN) expression. Methods Seventy-two Sprague-Dawley rats were randomly and equally divided into 4 groups including a sham group, a HBOP+sham group, a simple MCAO group and a HBOP+MCAO group (*n*=18). The neurological deficits and cerebral infarction volume were detected in the rats at 12 h after permanent MCAO. The pathological changes of ischemic regions were observed under a light microscope by HE staining, and the expression of OPN in ischemic regions was determined by Western blotting. Results The scores of neurological deficits at 12 h after MCAO were 0 in the sham and HBOP+sham groups, 3.80±0.79 in the simple MCAO group, and 2.50±0.97 in the HBOP+MCAO group. The scores of balance ability at 12 hours after MCAO were 5 in the sham and HBOP+sham groups, 1.50±1.08 in the simple MCAO group, and 2.70±2.95 in the HBOP+MCAO group. The proportions of cerebral infarction volume at 12 hours after MCAO were 0 in the sham and HBOP+sham groups, 49.22±7.07 in the simple MCAO group, and 41.96±3.15 in the HBOP+MCAO group. Compared with the simple MCAO group, the score of neurological deficits reduced significantly (*P*<0.05), the score of balance ability increased significantly (*P*<0.05), and the proportion of cerebral infarction volume was significantly lower in the HBOP+MCAO group at 12 h after MCAO (*P*<0.05). The pathological injury of brain tissues in ischemic region was significantly relieved, and the expression of OPN was upregulated in the HBOP+MCAO group. Conclusion HBOP plays a neuroprotective role in rats after MCAO, and the mechanism may be associated with the upregulation of OPN.

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