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不同压力高压氧预处理与大鼠脑缺血灌注损伤缺血半暗带神经元细胞凋亡 [点此下载全文](#)

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摘要:

摘要目的: 观察不同压力高压氧预处理(HBO-PC)对大鼠脑缺血再灌注后缺血半暗带神经细胞凋亡的影响。**方法:** 将48只Wistar大鼠随机分为3组: 假手术组(n=8); 对照组: 大脑中动脉闭塞(MCAO)模型组(n=8); 实验组: HBO-PC+MCAO组(n=32)。实验组再按不同的HBO-PC压力分为1.5 ATA(0.15MPa)、2.0ATA(0.20MPa)、2.5ATA(0.25MPa)和3.0ATA(0.30MPa)4个亚组, 每组8只。按不同治疗压力, 每次吸氧1h、隔天1次、共5次, 10d完成。最后一次HBO-PC 24h后, 根据Zea-Longa线栓法制作MCAO再灌注损伤模型, 缺血2h再灌注24h后用免疫组织化学法和原位末端脱氧核糖转移酶标记(TUNEL)法检测脑缺血半暗带神经细胞凋亡情况。假手术组和对照组不进行HBO或常压氧治疗, 10d后处理同实验组。**结果:** 实验组动物行为改善, 脑梗死灶缩小, 脑缺血半暗带凋亡细胞数和半胱天冬蛋白酶-3(caspase-3)阳性细胞数不同程度降低, B细胞淋巴瘤/白血病-2(Bcl-2)表达不同水平增高, 与对照组比较差异均有显著性意义(P<0.05); 而2.0ATA和2.5ATA压力条件相比较1.5ATA和3.0ATA上述凋亡指标差异亦有显著性(P<0.05); 但2.0ATA和2.5ATA间, 1.5ATA和3.0ATA间差异均无显著性意义(P>0.05)。结论: 通过下调缺血半暗带神经元线粒体途径的凋亡水平, HBO-PC可以减轻大鼠脑缺血再灌注损伤, 组内比较2.0ATA和2.5ATA下HBO-PC优于1.5ATA和3.0ATA。

关键词: [高压氧 预处理](#) [脑缺血再灌注](#) [半胱天冬蛋白酶-3](#) [B细胞淋巴瘤/白血病-2](#)

Influences of different atmosphere absolute hyperbaric oxygen preconditioning on the ischemia penumbra apoptosis in rats with focal cerebral ischemia-reperfusion injury [Download Fulltext](#)

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Fund Project:

Abstract:

Abstract Objective: To study the influences of different atmosphere absolute (ATA) hyperbaric oxygen preconditioning (HBO-PC) on the neuroprotective and apoptosis related protein/gene expressions of caspase-3 and Bcl-2 in rats with cerebral ischemia-reperfusion injury. **Method:** Totally 48 Wistar rats were randomly assigned to the following three groups: sham group (n=8), control group(MCAO group, n = 8), and trial group (HBO-PC plus MCAO group, n=32). The rats in trial group were subdivided into, 1.5ATA (0.15MPa) subgroup, 2.0ATA (0.2 MPa) subgroup, 2.5ATA (0.25MPa) subgroup, and 3.0ATA(0.3MPa) subgroup, with 8 rats in each group. HBO-BC was administered by using 100% oxygen at different ATA for 60min at 24h interval for 5 times in 10d. The last HBO-PC was performed at 24h before middle cerebral artery occlusion(MCAO) produced by Zea-Longa filament method with some modifications. The samples of each group underwent immunohistochemistry staining and TUNEL reaction to observe the expressions of cysteine-aspartate protease-3(caspase-3) and B cell lymphoma/leucemia gene(Bcl-2) and apoptosis of neurons in ischemia penumbra. **Result:** After HBO-PC with 1.5ATA、2.0ATA、2.5ATA and 3.0ATA all rat's infarction volume decreased, neurological behavior improved, meanwhile caspase-3 activity decreased, expression of Bcl-2 upregulated, and apoptosis of ischemic penumbra tissue abated. In all trial sub groups, above indexes showed significant difference as compared with that in control group(P<0.05), however, the effects of HBO-PC with 2.0ATA and 2.5ATA were superior to that 1.5ATA and 3.0ATA (P<0.05). **Conclusion:** HBO-PC protects brain tissues from ischemia-reperfusion injury by suppressing mitochondrial apoptotic pathways. The effects of HBO-PC with 2.0ATA and 2.5ATA were superior to that with 1.5ATA and 3.0ATA.

Keywords: [hyperbaric oxygen](#) [preconditioning](#) [ischemia-reperfusion](#) [cysteine-aspartate protease-3](#) [B cell lymphoma/leucemia-a-2](#)

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