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摘要:

摘要目的:探讨高压氧(HBO)对两种实验性脑出血大鼠模型血肿周围水肿及水通道蛋白-4(AQP-4)表达的影响。**方法:**将126只健康雄性SD大鼠随机分为5组:①假手术组6只(SHG);②自体血诱导脑出血(A-ICH)对照一组30只;③胶原酶诱导脑出血(C-ICH)对照二组30只;④A-ICH模型加高压氧治疗(A-ICH+HBO)实验一组30只;⑤C-ICH模型加高压氧治疗(C-ICH+HBO)实验二组30只,后4组又随机分为术后24h、48h、72h、5d、7d五个时间点组,每组6只大鼠。高压氧治疗自术后24h开始,1次/d。于相应时间点将大鼠处死,进行脑水肿和AQP-4的测定。结果:A-ICH模型成功率为65%,C-ICH模型成功率为75%。两对照组和两实验组大鼠脑组织含水量各时间点均高于假手术组,(A-ICH+HBO)经高压氧治疗后各时间点(24h、48h、72h、5d、7d)含水量均低于(A-ICH组),差异除24h组外均有显著性意义(P<0.05)。(C-ICH+HBO)经高压氧治疗后仅在ICH后48h和5d两个时间点与C-ICH对照组差异有显著性意义(P<0.05)。A-ICH+HBO和C-ICH+HBO组相比,前者水肿改善更早、更明显,尤其在72h时,差异显著(P<0.05)。脑出血后大鼠脑组织中AQP-4在各组均有表达,假手术组呈低表达状态,A-ICH和C-ICH两个对照组在脑出血后24h开始升高,48h达到高峰,72h后开始逐渐降低,7d时表达水平同假手术相近,但仍高于假手术组,A-ICH组与C-ICH组相比AQP-4表达更显著,但除72h组外其他时间点两组间无显著性差异(P>0.05)。(A-ICH+HBO)组各个时间点脑出血周围AQP-4的表达与A-ICH比较显著降低,差异具有显著性意义(P<0.05)。但(C-ICH+HBO)组AQP-4低表达仅在48h和72h与C-ICH组有差异(P<0.05)。A-ICH+HBO组与C-ICH+HBO组相比AQP-4改善的较早、且明显,尤其在48h和72h差异显著(P<0.05)。结论:HBO通过下调AQP-4的表达可有效减轻脑水肿。比较两种ICH模型发现,A-ICH模型在高压氧治疗中的敏感性更高,更适合高压氧在治疗脑出血水肿方面的研究。

关键词: [高压氧](#) [脑出血](#) [脑水肿](#) [水通道蛋白-4](#)

Effects of hyperbaric oxygen on brain edema and expression of aquaporin-4 surrounding brain tissue of hemorrhagic focus following experimental intracerebral hemorrhage in two kinds of rat models [Download Fulltext](#)

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Abstract:

Abstract Objective:To study the effects of hyperbaric oxygen (HBO) on brain edema and expression of aquaporin-4(AQP-4) surrounding brain tissue of hemorrhagic focus following experimental intracerebral hemorrhage(ICH) in two kinds of rat models. **Method:**A total of 126 rats were randomly divided into five groups: sham-operated group(SHG, 6 rats);control-1 group(autologous blood induced intracerebral hemorrhage model,A-ICH,30 rats), control-2 group(collagenase-induced intracerebral hemorrhage model, C-ICH, 30 rats), trial-1 group(A-ICH+HBO, 30 rats),trial-2 group(C-ICH+HBO,30 rats).HBO therapy was intervenced at 24h after operation,once a day.All rats were sacrificed at 24h, 48h, 72h, 5d,7d post operation (each time point 6 rats) . Brain edema and expression of AQP-4 were tested. **Result:**The success rates of A-ICH model and C-ICH model were 65% and 75% respectively. Brain edema content of A-ICH, C-ICH, A-ICH+HBO and C-ICH+HBO groups were significant higher than that of SHG group(P<0.05) .The cerebral edema of A-ICH+HBO and C-ICH+HBO groups alleviated obviously compared with A-ICH and C-ICH groups, and the difference was significant respectively at 48h,72h,5d,7d and 48h,5d post operation (P<0.05) . The brain edema of A-ICH+HBO group alleviated more early and obviously than that of C-ICH+HBO group, especially at 72h post operation(P<0.05) .The expression of AQP-4 appeared in all rats brain tissue,but expression of AQP-4 in SHG group was lower. That of A-ICH and C-ICH groups started rising at 24h post operation,the peak appeared at 48h,then dropped at 72h,but there were still significant different compared with SHG group at 7d post operation(P<0.05) .The difference between A-ICH group and C-ICH group was significant at 72h post operation(P<0.05) , and the difference between A-ICH+HBO group and A-ICH group was significant at all time points post operation(P<0.05) . but the difference between C-ICH+HBO group and C-ICH group was significant only at 48h and 72h post operation(P<0.05) . Compared with C-ICH +HBO group, expression of AQP-4 in A-ICH+HBO group was more obvious and early,especially at 48h and 72h post operation(P<0.05) . **Conclusion:**HBO might play neuroprotection role by relieving brain edema and down-regulating AQP-4 expression. A-ICH model was more fit for brain edema study of ICH rat.

Keywords:[hyperbaric oxygen](#) [intracerebral hemorrhage](#) [brain edema](#) [aquaporin-4](#)

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