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人CR1-SCR1-3蛋白对急性大鼠脑缺血再灌注损伤的

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Title: Protective effect of CR1-SCR1-3 protein on acute cerebral ischemia and reperfusion injury in rats

作者: 杨绍俊; 张璇; 路延之; 汪正清
第三军医大学基础医学部微生物学教研室，重庆市微生物工程实验室

Author(s): Yang Shaojun; Zhang Xuan; Lu Yanzhi; Wang Zhengqing
Department of Microbiology, Chongqing Laboratory of Microbial Engineering, College of Basic Medical Sciences, Third Military Medical University, Chongqing, 400038, China

关键词: 补体; 人补体受体1型; 短同源重复1-3; 大脑中动脉栓塞; 脑缺血再灌注损伤; 炎症

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摘要: 目的 探讨补体活化在大鼠急性脑缺血再灌注中的作用及人补体受体1型SCR1-3蛋白(CR1-SCR1-3)的保护作用。 方法 健康雄性SD大鼠75只，采用完全随机设计分组法分为假手术组(*n*=15)、CI/R组(*n*=30)及CI/R+CR1-SCR1-3组(*n*=30)。线栓法建立大鼠大脑中动脉栓塞模型，缺血1 h，再灌注24 h，对大鼠进行行为学检测，记录神经功能缺陷评分；TTC染色法测定脑梗死体积；制作脑匀浆测定大脑皮层髓过氧化物酶（MPO）活性、丙二醇(MDA)含量及超氧化物歧化酶(SOD)活性；制备切片观察大脑皮质区补体C4b沉积及病理改变。 结果 缺血再灌注24 h后，CR1-SCR1-3蛋白可明显改善CI/R+CR1-SCR1-3组大鼠神经功能(*P*<0.05)；脑梗死体积亦明显减少(*P*<0.01)；与CI/R组比较，CI/R+CR1-SCR1-3组MPO活力、MDA含量显著降低(*P*<0.01)，而SOD活性显著增高(*P*<0.01)；缺血脑组织皮质区原位补体C4b沉积显著减少(*P*<0.01)，病理损伤亦明显减轻。 结论 补体活化参与了脑缺血再灌注损伤过程，CR1-SCR1-3蛋白对大鼠急性CI/R损伤具有保护作用。

Abstract: Objective To investigate the effect of complements on acute cerebral ischemia and reperfusion (CI/R) injury and the protective effect of complement receptor 1 (CR1)-SCR1-3 protein. Methods A total of 75 adult male Sprague-Dawley rats were randomly divided into three groups including a sham operation group (*n*=15), a CI/R injury group (*n*=30) and a CI/R injury +CR1-SCR1-3

group (*n*=30). Transient focal cerebral ischemia was induced by intraluminal middle cerebral artery occlusion (MCAO) method. After MCAO for 1 h and reperfusion for 24 h, the effects of CR1-SCR1-3 protein on neurological deficits and cerebral infarct size were detected by neurofunctional deficit score and TTC staining, respectively. The activities of myeloperoxidase (MPO) and superoxide dismutase (SOD) and the content of malondialdehyde (MDA) in cerebral cortex were determined. The deposition of C4b in cerebral cortex and the pathological changes were also assessed. Results After CI/R injury for 24 h, CR1-SCR1-3 could significantly improve rat neurological functions (*P*<0.05) and lead to a reduction in cerebral infarct size (*P*<0.01). Pretreatment with CR1-SCR1-3 could decrease the MPO activity(*P*<0.01) and the content of MDA(P<0.05), and increase the SOD activity in cerebral cortex (*P*<0.01). Decreased C4b deposition as well as improved pathological changes were also observed in the CI/R injury+CR1-SCR1-3 group (*P*<0.01). Conclusion Complement activation plays a critical role in CI/R injury, and CR1-SCR1-3 possesses a protective effect by inhibiting the over-activation of complement system.

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