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论著

牛磺酸对皮质神经元急性氧糖缺失所致损伤的保护作用

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摘要 目的 已证实牛磺酸对在体脑缺血有保护作用，本研究观察其对缺失氧糖的离体神经元是否有直接的保护作用及可能的作用机制。方法 制备离体大鼠脑皮质神经元的氧糖缺失模型。在氧糖缺失前20 h及氧糖缺失4 h过程中，分别给予牛磺酸5，10和20 mmol·L^{-1}。MTT法和流式细胞术检测神经元的死亡率；Fura-2/AM负载检测神经元内游离钙离子水平（$[Ca^{2+}]_i$）；高效液相色谱法检测培养基中谷氨酸水平。结果 氧糖缺失可致神经元死亡增加，$[Ca^{2+}]_i$和培养基中谷氨酸水平异常升高；牛磺酸处理可使氧糖缺失引起的神经元死亡率明显降低，抑制氧糖缺失引起的神经元$[Ca^{2+}]_i$和胞外谷氨酸浓度的异常升高。结论 牛磺酸可以减轻氧糖缺失引起的大鼠皮质神经元损伤，其机制可能与其抑制胞内钙超载和抑制谷氨酸释放或漏出有关。

关键词 牛磺酸 大脑皮质 神经元 氧糖缺失 钙, 细胞内 谷氨酸 细胞凋亡

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Neuroprotective effect of taurine against acute cortical neuron injury induced by oxygen-glucose deprivation

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Abstract

AIM Taurine was reported neuroprotective under several ischemic models *in vivo*. In this study, the direct effect of taurine against oxygen-glucose deprivation (OGD) inducing acute neuronal injury and the underlying mechanisms *in vitro* were investigated. **METHODS** Four hours OGD was used to induce *in vitro* ischemic injury in rat cortical neurons. Taurine 5, 10 and 20 mmol·L^{-1} was added 20 h before and during 4 h OGD period respectively. Mortality rate of neuron was assayed by MTT and flow cytometry methods. Level of neuronal $[Ca^{2+}]_i$ was detected by Fura 2/AM loading. Amino acid concentrations in culture media were measured by high performance liquid chromatography. **RESULTS** Under OGD conditions, neuronal death was markedly increased, and the levels of neuronal $[Ca^{2+}]_i$ and extracellular glutamate level were enhanced obviously. Taurine pretreatment obviously decreased the percentage of neuronal death induced by OGD. In addition, abnormal elevation of neuronal $[Ca^{2+}]_i$ and extracellular glutamate level induced by OGD both were markedly repressed by taurine. **CONCLUSION** Taurine can alleviate rat cortical neuron injury induced by OGD, the mechanisms were likely due to repressing calcium overload and inhibiting excessive release or leakage of glutamate under such conditions.

Key words taurine cerebral cortex neurons oxygen glucose deprivation calcium cytosolic glutamic acid apoptosis

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