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论著

梭曼中毒后不同时间大鼠海马N-甲基-D-天冬氨酸受体亚单位2A/2B及GABAα1受体表达的变化

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摘要 目的 观察梭曼染毒大鼠海马组织N-甲基-D-天冬氨酸(NMDA)受体亚单位NR2A, NR2B及GABAα1受体在中毒后不同时间mRNA与蛋白表达的变化。方法 大鼠先ip给予HI-6 125 mg·kg^{-1}一次性sc 给予梭曼160 μg·kg^{-1}, 采用HE染色及TUNEL染色观察中毒后不同时间大脑海马组织病理损伤及神经元细胞凋亡;实时荧光定量PCR及Western印迹法测定海马组织中NR2A, NR2B及GABAα1受体在梭曼染毒后30 min, 1 h, 2 h, 6 h, 24 h, 48 h及7 d的表达变化。结果 组织病理学检查结果显示, 在梭曼染毒后1 h出现明显的细胞损伤, 在染毒后24 h细胞损伤最为严重;TUNEL染色显示, 在染毒后6 h出现明显细胞凋亡, 在染毒后24 h凋亡最为严重。染毒后2 h, 与正常对照组比较, NR2A及NR2B蛋白表达均显著上调, 但GABAα1受体到染毒后24 h才出现表达明显增加。梭曼染毒后2~6 h, 与正常对照组比较, 海马NR2A, NR2B及GABAα1受体mRNA表达显著上调, 染毒后24~48 h, NR2A及NR2B受体mRNA出现不同程度降低, 至染毒后7 d恢复正常水平。结论 梭曼染毒后期, 出现NMDA受体亚单位NR2A, NR2B及GABAα1受体mRNA及蛋白表达异常;该表达异常可能与海马神经细胞损伤及凋亡存在一定关系。

关键词 梭曼 惊厥 受体, N-甲基-D-天冬氨酸 受体, GABA 脑损伤

分类号 R994.7

Changes of N-methyl-D-aspartate receptor subunits 2A/2B and GABAα1 receptor expression in hippocampus of rats after soman exposure

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Abstract

OBJECTIVE To observe the changes of N-methyl-D-aspartate (NMDA) receptor subunits(NR) 2A and NR2B as well as GABAα1 receptor expression in mRNA and protein levels in hippocampus at different time point since soman poisoning in rats. **METHODS** On the establishment of the soman-induced seizure model in rats which were injected intraperitoneally with soman 160 μg·kg^{-1}, the histopathological changes and neurons apoptosis in CA1 of hippocampus at different time points since exposure to soman were observed by HE staining and TUNEL staining, respectively. Meanwhile, the levels of mRNA and protein of NR2A, NR2B and GABAα1 receptor were tested at 30 min, 1, 2, 6, 24, 48 h and 7 d following exposure to soman by real-time quantitative PCR and Western blotting. **RESULTS** The neuropathological damage was shown at 1h and became the worst at 24 h in CA1 of hippocampus following exposure to soman. Compared with normal control group, the neurons in CA1 of hippocampus shown an apparent apoptosis at 6 h, and the cell apoptosis became the worst at 24 h, too. Compared with normal control group, the protein level of NR2A and NR2B increased significantly at 2 h while GABAα1 receptor kept unchanged until 24 h since soman poisoning. The mRNA level of NR2A, NR2B and GABAα1 receptors increased significantly at 2-6 h after soman exposure in CA1 of