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论文

褪黑素对侧脑室注射氯化铝致小鼠学习记忆障碍的改善作用及其机制

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摘要:

目的探讨褪黑素(MLT)对氯化铝($AlCl_3$)致小鼠拟阿尔茨海默病学习记忆功能障碍的改善作用及其机制。方法避暗法测试各组小鼠被动回避能力,水迷宫法测空间学习记忆能力及测定大脑皮层及海马组织超氧化物歧化酶(SOD)、谷胱甘肽过氧化物酶(GSH-Px)活性及丙二醛(MDA)含量。结果MLT可明显改善$AlCl_3$致小鼠被动回避记忆能力、空间学习记忆能力的下降;对$AlCl_3$诱发的小鼠大脑皮层及海马组织总SOD,CuZn-SOD和GSH-Px活性下降及MDA含量增加均有显著的对抗作用。结论MLT对$AlCl_3$致小鼠学习记忆功能障碍有显著改善作用,其抗氧化作用可能是其发挥效应的重要机制之一。

关键词: 褪黑素 铝 学习记忆障碍 阿尔茨海默病 抗氧化作用

EFFECT OF MELATONIN ON LEARNING AND MEMORY IMPAIRMENT INDUCED BY ALUMINUM CHLORIDE AND ITS MECHANISM

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Abstract:

AIMTo investigate the effect of melatonin on learning and memory impairment in mice induced by aluminum chloride and its possible mechanism. METHODSMice were treated with intracerebroventricular (icv) injection of 2 μL 5% aluminum chloride solution, once a day for 5 d. At the same time, the mice were given intraperitoneally melatonin 0.6, 3 and 15 $mg \cdot kg^{-1}$, once a day for 14 d. The passive avoidance of the mice was assessed by step-through test on day 15 after the last icv injection, and then the place navigation and spatial probe ability by Morris water maze were tested. After the spatial probe test, the activities of total superoxide dismutase (T-SOD), CuZn superoxide dismutase (CuZn-SOD), glutathione peroxidase (GSH-Px) and the content of malondialdehyde (MDA) in the cerebral cortex and hippocampus of mice brain were determined. RESULTSMelatonin ameliorated significantly the impairment of passive avoidance memory, the place navigation and spatial probe ability of mice induced by aluminum chloride. Melatonin was found to prevent significantly the decline of T-SOD, CuZn-SOD and GSH-Px activities, the increase of MDA content in the cortex and hippocampus of mouse brain induced by aluminum chloride. CONCLUSION The results suggest that melatonin improves significantly the learning and memory impairment in mice induced by aluminum chloride, and this effect may be attributed to its antioxidation.

Keywords: aluminum learning and memory impairment Alzheimer's disease antioxidation melatonin

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