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论著

金钗石斛生物总碱对脂多糖诱导大鼠学习记忆功能减退的改善作用

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摘要 目的 探讨金钗石斛生物总碱（DNLA）对脂多糖（LPS）诱导的大鼠学习记忆功能减退的改善作用及可能的作用机制。方法 成年雄性SD大鼠经Morris水迷宫训练合格后，随机分为模型组和假手术组。模型组大鼠左侧脑室微量注射LPS（10 g·L^{-1}）5 μL后分为LPS，LPS+布洛芬（Ibu，40 mg·kg^{-1}），LPS+DNLA（20，40和80 mg·kg^{-1}）组，假手术组左侧脑室注射5 μL生理盐水。大鼠清醒后ig给予Ibu或DNLA，每天1次，连续14 d。用Morris水迷宫检测大鼠空间学习记忆能力；HE染色观察海马神经元形态改变；免疫组织化学法检测海马淀粉样β蛋白片段1-42（$A\beta_{1-42}$）含量；实时荧光定量PCR检测海马半胱氨酸天冬氨酸蛋白酶（caspase）3/8 mRNA表达水平。结果 侧脑室注射LPS后，大鼠水迷宫逃避潜伏期及搜索距离明显延长，海马出现神经元凋亡和坏死改变。Ibu和DNLA均能明显缩短模型大鼠水迷宫逃避潜伏期和搜索距离，减轻神经元凋亡和坏死，降低海马$A\beta_{1-42}$含量和caspase 3/8 mRNA表达水平。结论 DNLA可改善LPS诱导的大鼠学习记忆功能减退，其机制可能与降低海马caspase 3/8 mRNA表达、减少$A\beta_{1-42}$产生有关。

关键词 金钗石斛 生物碱 脂多糖 淀粉样β蛋白 学习 记忆

分类号 R971

Improvement of *Dendrobium nobile* Lindl. alkaloids on cognitive deficit in rats induced by lipopolysaccharides

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Abstract

AIM To explore the protective effect of *Dendrobium nobile* Lindl. alkaloids （DNLA）on the learning and memory deficit in rats induced by lipopolysaccharides (LPS), and its possible underlying mechanisms. **METHODS** After trained by Morris water maze method, the qualified adult male SD rats were randomly divided into sham group and model group. The rat model was induced with slow microinjection of LPS （10 g·L^{-1}）5 μL into left lateral cerebral ventricles, and then divided into LPS, LPS+ibuprofen (40 mg·kg^{-1}) and LPS+DNLA (20, 40 and 80 mg·kg^{-1}) subgroups. The rats in sham group were microinjected with normal saline 5 μL. After regaining consciousness the sober rats were given (ig) ibuprofen and DNLA, respectively, once daily for 14 d. The spatial learning and memory abilities were tested by Morris water maze. The morphological changes in hippocampal neurons were observed with HE staining under the optical microscope. The content of amyloid beta protein fragment 1-42 ($A\beta_{1-42}$) in the hippocampus was examined by immunohistochemical analysis, and the expressions of caspases 3/8 mRNA were detected by real time RT-PCR, respectively. **RESULTS** Injection of LPS to lateral cerebral ventricles evidently prolonged the escape latency and searching distance of rats in Morris water maze, and impaired the hippocampal neurons with apoptosis and necrosis. However, ibuprofen and DNLA could markedly ameliorate the rat learning and memory deficit, attenuate the neuron apoptosis and necrosis, decrease the $A\beta_{1-42}$ content and down-regulate the expressions of caspases 3/8 mRNA in the hippocampus. **CONCLUSION** DNLA can attenuate cognitive deficits in rats induced by LPS, which may be related with the down-regulation of expressions of caspases 3/8 mRNA and the decrease of $A\beta_{1-42}$ in the hippocampus.

Key words Dendrobium nobile Lindl. alkaloid lipopolysaccharides amyloid beta-protein learning memory

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