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刺五加对睡眠剥夺大鼠学习记忆及海马单胺类神经递质的影响

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中文摘要：目的：探讨刺五加对睡眠剥夺大鼠学习记忆能力及对海马单胺类神经递质AchE(乙酰胆碱酯酶),5-HT(5-羟色胺)、NE(去甲肾上腺素)、5-HIAA(5-羟吲哚乙酸)的影响。 方法：将75只大鼠随机分为5组,大平台对照组、睡眠剥夺组、刺五加高、中、低剂量组。给药组分别给予刺五加溶液(11.2,5.6,2.8 g·kg^{-1}),大平台对照组、睡眠剥夺组给予相应容量的蒸馏水,连续给药7 d后开始实验。用小平台法建立快速眼动睡眠(REMS)剥夺大鼠模型,4 d后,以六角迷宫行为学方法测试学习记忆能力,并测定大鼠海马匀浆液中AchE,5-HT,NE,5-HIAA的含量及计算出5-HIAA/5-HT的比值。 结果：与大平台对照组比较,睡眠剥夺组错误次数增多、认知率降低,且差异显著(P<0.01),但寻找时间缩短(P<0.05);在刺五加干预下,错误次数明显减少、认知率升高(P<0.01),寻找时间缩短(P<0.01)。各给药组大鼠海马匀浆液中的5-HT,NE,5-HIAA,5-HIAA/5-HT含量均显著高于睡眠剥夺组(P<0.05或P<0.01),且呈剂量递增趋势;各给药组AchE含量显著低于睡眠剥夺组而高于大平台对照组(P<0.05或P<0.01)。 结论：刺五加改善睡眠剥夺大鼠学习记忆能力的机制可能是通过调节睡眠剥夺造成的单胺类神经递质紊乱,加速5-HT的代谢转化,调节NE的异常,增高海马组织中AchE活性实现的。

中文关键词：刺五加 睡眠剥夺 单胺类神经递质

Effects of Acanthopanax on Learning and Memory and Monoamine Neurotransmitters in Hippocampus of Sleep Deprived Rats

Abstract: Objective: To study the protective mechanism of acanthopanax on learning and memory and monoamine neurotransmitters acetylcholinesterase (AchE), serotonin(5-HT), norepinephrine(NE), 5-hydroxindole acetic acid (5-HIAA) of hippocampus in sleep deprivation rats. Method: Total of 75 male wistar rats were randomized into 5 groups, large platform group, sleep deprivation group, three treatment groups(high, middle and low dose).Treatment groups were given Acanthopanax solution (11.2, 5.6, 2.8 g·kg^{-1}) for 7 days.The others were given distilled water. A small platform was used to establish rapid eye movement sleep(REMS) deprivation model in rats. After 4 days, the ability of learning memory and space exploration was tested by Hexagonal maze in rats. The level of AchE,5-HT,NE,5-HIAA in hippocampus homogenate were measured. Result: Compared with a large platform, the number of errors of sleep deprivation group increased,the rate of cognitive reduced(P<0.01),but finding time was shorten(P<0.05). After administration of Acanthopanax solution, the number of errors reduced significantly, the rate of cognitive increased(P<0.01), finding time was shorten(P<0.01), the level of 5-HT, NE. 5-HIAA was higher in Acanthopanax solution than sleep deprivation group (P<0.05 or P<0.01). The AchE level in treatment groups was lower thanthat in sleep deprivation group but higher than large platform group (P<0.05 or P<0.01). Conclusion: Acanthopanax can improve learning and memory ablity in sleep deprived rats, and the mechanism may involve regulating the sleep deprivation caused by disorders of monoamine neurotransmitter,accelerating the metabolic conversion of 5-HT, regulating NE, and AchE activity in the hippocampus.

keywords: Acanthopanax sleep deprivation monoamine neurotransmitters

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