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论文

EGCG对阿尔茨海默病小鼠神经保护作用及机制

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摘要:

目的 探讨茶多酚对小鼠行为学、海马组织中淀粉蛋白前体β位分解酶1（BACE1）表达以及微管相关蛋白（TAU蛋白）磷酸化水平影响。方法 以快速老化小鼠（SAMP8）作为衰老模型，SAMR1小鼠（非老化）为对照，以饮水方式给予茶多酚主要成分表没食子儿茶素没食子酸酯（EGCG），使用Morris水迷宫检测大鼠学习记忆能力，Western blot、逆转录聚合酶链反应检测BACE1基因表达及TAU蛋白磷酸化水平的变化。结果 训练第5天，与SAMR1组比较，模型组小鼠逃避潜伏期[（49±2.98）s]延长、目标象限停留时间[（13.52±3.11）s]缩短（*P*<0.05）；与模型组比较，EGCG组小鼠逃避潜伏期[（41±3.03）s]缩短，目标象限停留时间[（25.47±4.78）s]延长（*P*<0.05）；与SAMR1组比较，模型组小鼠海马组织中BACE1基因mRNA水平（2.835±0.902）、TAU蛋白s202及s396位点磷酸化水平升高（*P*<0.05）；与模型组比较，EGCG组小鼠海马组织BACE1基因mRNA水平（1.574±0.556）、TAU蛋白s 202及s 396位点磷酸化水平明显下降（*P*<0.05）。结论 茶多酚主要成分EGCG能明显改善快速老化小鼠学习记忆能力，其机制与下调小鼠脑海马BACE1表达、降低TAU蛋白磷酸化水平有关。

关键词： 表没食子儿茶素没食子酸酯（EGCG） SAM系小鼠 淀粉蛋白前体β位分解酶1（BACE1）

Effects of EGCG on nerve protection and BACE1 expression level in hippocampus of mice with Alzheimer’s disease

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Abstract:

Objective To explore neuroprotective effects of epigallocatechin-3-gallate(EGCG)and its influence on levels of beta-site amyloid precursor protein-cleaving enzyme 1(BACE1)and Tau protein phosphorylation in hippocampus of mice with Alzheimer's disease.Methods We adopted senescence-accelerated mouse prone-8(SAMP8) as Alzheimer's disease(AD)animal model;we usded Morris water maze to measure learning and memory function of the mice and real-time quantitative reverse transcriptase polymerase chain reaction(qRT-PCR)and Western blot to investigate neuroprotective effect of EGCG and its influence on levels of BACE1 expression and phosphorylation of TAU S202 and S396.Results Compared to those of SAMR1 mice(a strain of resistant to senescence), the escape latency(49±2.98 s) prolonged and target quadrant residence time(13.52±3.11 s)was shortened in SAMP8 group 5 days after the training(*P*<0.05 for all).Compared with those of the SAMP8 group, the escape latency(41±3.03 s)was shortened and target quadrant residence time(25.47±4.78 s)was prolonged in EGCG-treated group(*P*<0.05).The results of qRT-PCR and Western blot showed that the BACE1 level(2.835±0.902 for P8 and 1.574±0.556 for EGCG group)was down-regulated and the phosphorylation level of TAU S202 and S396 decreased remarkably after EGCG treatment.Conclusion EGCG reduces BACE1 expression and TAU phosphorylation level and the neuroprotective effect of EGCG provides a new strategy for Alzheimer's disease prevention and treatment.

Keywords: epigallocatechin-3-gallate senescence-accelerated mouse real-time quantitative reverse transcriptase polymerase chain reaction beta-site amyloid precursor protein-cleaving enzyme 1

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