

Red Mold Rice ameliorates impairment of memory and learning ability in intracerebroventricular amyloid beta-infused rat by repressing amyloid beta accumulation.

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Amyloid beta (Abeta) peptide related to the onset of Alzheimer's disease (AD) damaged neurons and further resulted in dementia. Monascus-fermented red mold rice (RMR), a traditional Chinese medicine as well as health food, includes monacolins (with the same function as statins) and multifunctional metabolites. In this study, ethanol extract of RMR (RE) was used to evaluate neuroprotection against Abeta40 neurotoxicity in PC12 cells. Furthermore, the effects of dietary administration of RMR on memory and learning abilities are confirmed in an animal model of AD rats infused with Abeta40 into the cerebral ventricle. During continuous Abeta40 infusion for 28 days, the rats of test groups were administered RMR or lovastatin. Memory and learning abilities were evaluated in the water maze and passive avoidance tasks. After sacrifice, cerebral cortex and hippocampus were collected for the examination of AD risk factors. The in vitro results clearly indicate that RE provides stronger neuroprotection in rescuing cell viability as well as repressing inflammatory response and oxidative stress. RMR administration potently reverses the memory deficit in the memory task. Abeta40 infusion increases acetylcholinesterase activity, reactive oxygen species, and lipid peroxidation and decreases total antioxidant status and superoxide dismutase activity in brain, but these damages were potently reversed by RMR administration, and the protection was more significant than that with lovastatin administration. The protection provided by RMR is able to prevent Abeta fibrils from being formed and deposited in hippocampus and further decrease Abeta40 accumulation, even though Abeta40 solution was infused into brain continuously. (c) 2007 Wiley-Liss, Inc.

[J Neurosci Res.](#) 2007 Jul 30; [Epub ahead of print]

PMID: 17663476 [PubMed - as supplied by publisher]