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عنوان مقاله:

Memory and Learning Improvement by Resveratrol and Probiotics via the Gut-Brain Axis and Antioxidant Activity in Diabetic Rats

محل انتشار:

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خلاصه مقاله:

Background and Objectives: Diabetes affects the central nervous system associated with cognition, especially memory and learning. The present study aimed to investigate the effects of probiotics (living microorganisms that provide health benefits) and resveratrol (a polyphenol with potential antioxidant activity) combination on oxidative stress, glucagon-like peptide-۱ (GLP-۱), memory, and learning in diabetic rats. Materials and Methods: Male Wistar rats were randomly divided into five groups (six animals per group) of control, diabetic, probiotic-treated diabetic (۵۰×۱۰۹CFU/kg in drinking water), resveratrol-treated diabetic (۱۰ mg/kg, oral gavage), as well as probiotics and resveratrol-treated diabetic. The treatment procedures lasted for four weeks, and a Shuttle Box test was then performed to evaluate memory and learning. At the end of the study, animals were sacrificed, and the hippocampus was removed to perform biochemical studies. Results: The levels of malondialdehyde and total oxidative status significantly decreased in the diabetic group treated with combined resveratrol and probiotics (P<۰.۰۵). Furthermore, the levels of superoxide dismutase, catalase, and glutathione peroxidase significantly increased in the hippocampus of the diabetic group treated with combined resveratrol and probiotics (P<۰.۰۵). According to the results, the combined therapy improved memory and learning (P<۰.۰۵). In addition, the level of GLP-۱ increased in the treatment groups (P<۰.۰۵). Conclusion: Treatment with resveratrol and probiotics significantly normalized pyramidal cell densities in the hippocampus of diabetic rats. This combination also reduced oxidative stress and activated the gut-brain axis in diabetic animals.

کلمات کلیدی:

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