عنوان مقاله:

The Effect of Melanocortin ۴ Receptor Agonist RM-۴۹۳ on Cognitive Functions in Rats Fed with Western Diet

محل انتشار:

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خلاصه مقاله:

Background: The central melanocortin system is among those that plays a key role in the homeostatic regulation of energy balance and eating disorders. This study investigated the effect of melanocortin ۴ receptor (MC۴R) agonist setmelanotide (RM-۴۹۳) on changes in metabolic and cognitive functions.Methods: Thirty two male Sprague-Dawley rats were divided into ۴ groups including those fed with standard laboratory food and given phosphate buffered saline (PBS, ND group); fed with western-type diet and given PBS (WD group); fed with standard laboratory food and given RM-۴۹۳ (RM-۴۹۳ group); and fed with western-type diet and RM-۴۹۳(WD+RM-۴۹۳ group). After injection with PBS and RM-۴۹۳ injections for ۵ days, they were followed by elevated plus maze test and a novel object recognition test.Results: Nutrition with western-type diet resulted in an increase in serum cholesterol, high-density lipoprotein (HDL) and low-density lipoprotein (LDL) levels, respectively, and RM-۴۹۳ treatment decreased these values. Proopiomelanocortin (POMC), MC۴R and brain-derived neurotrophic factor (BDNF) expressions increased in groups fed with western-type diet and RM-۴۹۳. Treatment with RM-۴۹۳ in ND group increased the residence time in the open arm. In WD group, CA۳ region of the hippocampus revealed edema in stratum lucidum layer and degeneration in the pyramidal neurons unlike the WD+RM-۴۹۳ group.Conclusion: POMC-mediated pathway was activated as a result of an increase in body fat caused by a western-type diet. RM-۴۹۳ had alleviating effects on brain damages caused by a western-type diet and could improve cognitive functions.

کلمات کلیدی:

Western diet, Cognitive Functions, Brain, MC۴R, RM-۴۹۳