Effect of Capsicum annuum (sweet pepper) on cognitive function, brain oxidative stress status and apoptosis in obesity ovariectomized rats

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Statement of the Problem: Postmenopausal women are more susceptible to obesity and it is associated with many diseases such as cardiovascular disease, hypertension, Alzheimer's disease and cognitive deficits than premenopausal women. Moreover, the prevalence of cognitive impairment has increased in menopausal. Thus, neuronal impairment in obese post-menopausal women, are increasing their importance and require the effective therapeutic strategy. In this study, the effect of Capsicum annuum (sweet pepper) on the dysfunctions of brain in animal model of obese postmenopausal women was explored due to its benefits on memory impairments.

Methodology & Theoretical Orientation: Female Wistar rats, weighing 180-200 g, were induced experimental menopause by bilateral ovariectomy and then they were induced obesity with high-fat diet. Ovariectomized (OVX) rats with obesity were fed with High Fat Diet (HFD) containing 10% C. annuum for 8 weeks. The assessments of spatial memory and biochemical profiles, oxidative stress status and apoptosis in hippocampus were performed.

Findings: The results showed that when fed the obese OVX rats with 10% C. annuum memory enhancement was found. 10% C. annuum supplemented increased the activities of Glutathione Peroxidase (GPx) and Superoxide Dismutase (SOD) and also reduced Malondialdehyde (MDA) level and Acetylcholinesterase (AChE) activity in hippocampus. The C. annuum extracts increased Bcl-2 + cells and reduced expression of Bax in hippocampus.

Conclusion & Significance: These results indicated that eating 10% C. annuum extracts improved oxidative stress conditions, improved the cholinergic function in the hippocampus and increased the expression of Bcl-2 and reduced the expression of Bax resulted in reduction of neuronal death in both hippocampus and prefrontal cortex which are important for learning and memory, consequently improved memory. However, the precise detailed mechanism of action and the sub-chronic and chronic toxicity studies need further studies.

Biography

Supaporn Muchimapura has completed her PhD from Nottingham University, UK. She is the Head of the Department of Physiology, Faculty of Medicine, Khon Kaen University, Thailand. She has published more than 50 papers in reputed journals.

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