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Beneficial effects of *Ginkgo biloba* extract on hippocampal oxidative stress and serotonergic system of ovariectomized rats

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Menopause is associated to the development of physical and psychological alterations which arise in consequence to reduction of circulating estrogen levels. In cerebral structures involved in cognition and memory as hippocampus, hypoestrogenism may impair synaptic signaling, contributing to emergence of cognitive disturbances. Furthermore, cognitive impairment is also associated to accumulation of oxidative damages to different cell compounds. *Ginkgo biloba* extract (GbE), a widely used herbal supplement, present many benefits associated with its antioxidant and anti-inflammatory effects. Furthermore, we have previously demonstrated a stimulatory effect of GbE on the hypothalamic serotonergic system of ovariectomized rats. Therefore, the aim of this study was to evaluate GbE action on oxidative stress and 5-HT receptors expression in hippocampus of ovariectomized female rats. 2-month-old female Wistar rats had their ovaries surgically removed (OVX) or not (SHAM) and, sixty days after, was started the treatment with 500 mg/Kg of GbE for 14 days. Rats were then euthanized, and hippocampi were removed. Thereby, protein expression of 5-HT1A and 5-HT1B receptor and 5-HTT transporter quantification were performed, as well as glutathione (GSH), superoxide dismutase (SOD) and catalase (CAT) activities. Although no significant differences 5-HTT levels were observed, both 5-HT1A and 5-HT1B expression were diminished in OVX rats (P=0.0471 an P=0.004, respectively) in comparison to SHAM rats, while no differences were observed among OVX+GbE and SHAM groups. In addition, OVX rats also presented higher SOD activity (P=0.017) in comparison to SHAM group, while no differences were observed in the OVX+GbE group. However, no differences were observed in GSH and CAT activities. In summary, GbE extract played an antioxidant effect as it reduced SOD activity and also was able to protect against 5-HT1A and 5-HT1B reduction generated in hippocampus of ovariectomized rats. These findings point to a promising therapeutic use of GbE to improve life quality of post-menopausal women, especially in relation to cognition.

Biography

Monica Marques Telles graduated from Mackenzie University in Sao Paulo, Brazil, with a BSc in Biological Sciences, followed with a Master's degree and a PhD in Nutrition from Sao Paulo Federal University in Brazil. She currently works at Sao Paulo Federal University, Diadema Campus, being a Senior Lecturer in General Pathology and Pathophysiology for the Undergraduate Program, and also supervises research students in the Chemical Biology Post-graduate Program. Her area of expertise is around Human Physiology, Pathophysiology and Pharmacology, and her research focuses on central control of food intake, hypothalamic activity, serotonergic system, leptin secretion and activity, obesity, insulin resistance, cerebral microdialysis, proteomic analysis, high fat diets and phytotherapic diets.

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