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Effects of nesfatin-1 on rat model of Parkinson's disease induced by 6-hydroxydopamine

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Parkinson's disease (PD) is the second most common neurodegenerative disease which is characterized by dopaminergic neuronal loss in substantia nigra pars compacta and a significant amount of dopamine depletion in the striatum. Peripheral use of nesfatin-1, which is recently discovered brain-gut peptide showed anti-apoptotic and anti-inflammatory effects in rats with brain injury and subarachnoid hemorrhage. Effects of nesfatin-1 on rat model of PD induced by 6-hydroxydopamine (6-OHDA) is not known yet, however protective effects of nesfatin-1 was determined on the rotenone and MPTP-induced animal models of PD. In our study, we aimed to examine the effects of nesfatin-1 on gastric emptying and neuronal damage in 6-OHDA-induced PD model in Wistar rats. Unilaterally 6-OHDA-lesioned rats were treated daily with nesfatin-1 (1 µg/kg, s.c.) for 28 days. Locomotor activities and weight loss were measured and apomorphine-induced rotational behaviour was assessed. At the end of the experiment, rats were decapitated to determine gastric emptying rate and in another set of rats, brains, gastrointestinal tissues were evaluated histologically. Our results indicated that altered locomotor activities and rotational behaviour in 6-OHDA-lesioned rats were reversed with the nesfatin-1 treatment ($p < 0.05$; $p < 0.01$). Gastric emptying was delayed in 6-OHDA-induced rats compared to control rats ($p < 0.001$), while nesfatin-1 treatment in 6-OHDA-lesioned rats reduced the delay in gastric emptying ($p < 0.01$). In the morphological evaluation of brain tissues; it was observed that the activity of tyrosine hydroxylase increased in 6-OHDA-lesioned rats treated with nesfatin-1. We believe that these results will guide future experimental and clinical studies for the life quality purpose of patients with PD.

Biography

Damla Anil has completed her graduation from the Department of Molecular Biology and Genetics at Istanbul University and Master's from Histology and Embryology Department at Marmara University School of Medicine. She is pursuing her PhD study on Neurodegenerative Diseases at Marmara University.

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