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Exploring the Potential of Selective Phosphodiesterase-5 Inhibitor in a Rat Model of Streptozotocin-Induced Vascular Dementia

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Abstract

The present study investigates the effect of Tadalafil, a selective phosphodiesterase-5 (PDE-5) inhibitor, in a rat model of vascular dementia (VaD). Single intraperitoneal injection of STZ (50 mg/kg) was administered to Wistar rats to induced diabetes-associated vascular endothelial dysfunction and VaD. Morris water maze (MWM) test was employed to assess learning and memory. Endothelial dysfunction was assessed in the isolated aorta by observing endothelial-dependent vasorelaxation and levels of serum nitrite. Various biochemical and histopathological estimations were also performed. STZ produced significant impairment in endothelium-dependent vasorelaxation and decrease in serum nitrite levels indicating endothelial dysfunction. Further, these animals performed poorly on MWM, depicting impairment of learning and memory. There was a significant, rise in brain oxidative stress level (indicated by an increase in brain thiobarbituric acid reactive species and a decrease in reduced glutathione levels), increase in brain acetylcholinesterase activity and myeloperoxidase activity (a marker of inflammation). In addition, marked neutrophil infiltration and neurodegeneration were observed from histology of brain slices. Tadalafil (5 & 10 mg/kg; p.o.) / Donepezil (0.5 mg/kg, i.p. serving as standard) treatment significantly improved STZ induced endothelial dysfunction; memory deficits; and markedly restored changes in various biochemical estimations.

Biography:

I am Pankaj Bhatia Pursuing PhD in Punjabi University, Patiala. I have received a bachelor's degree in Pharmacy from Akal College of Pharmacy, Sangrur and a master's degree (Pharmacology) from I.S.F. College of Pharmacy, Moga, India. Working in exploring novel targets in subject of Pharmacology and Toxicology and the explicit area of interest is in Cerebrovascular and Neurodegenerative disorders. I am GPAT-2017 qualified, life member of SPER and have won best poster & other awards.

Speaker Publications:

1. Lockhart BP, Lestage PJ. "Cognition enhancing or neuroprotective compounds for the treatment of cognitive disorders: why? when? which?". Exp Gerontol 2003; 38(1-2): 119-28.
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