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Diabetes associated depression: Ondansetron, as antidepressant for streptozotocin induced diabetic depression in mice

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Diabetes as an energy metabolic defect plays a role in the etiology of several neurodegenerative disorders and cognitive deficits like Alzhemer's disease, Parkinson disease, Huntington's disease. Recent research explored depression as a severe complication of diabetes increasing morbidity and mortality rates along with socioeconomic burden. Neurochemical mechanism suggests that hyperglycemia and insulin insensitivity lead to progressive degeneration of neuronal circuit in brain areas (hippocampus, amygdale, brain stem) that involve in regulation of mood, behavior and cognitive function. Further causing downregulation of serotonin, dopamine, norepinephrine neurotransmission and hence developing depressive episodes. Hypothetically, insulin resistance progressively dysregulate hypothalamic-pituitary-adrenal axis and affects neuronal serotonergic activity. Thus the present study attempts to overcome diabetes associated depressive events. Diabetes was induced by single dose of streptozotocin (60mg/kg, intraperitoneally) followed by behavioral assays and antidepressant activity of ondansetron, a serotonin type-3 (5HT3) receptor antagonist (1mg/kg, intraperitoneally; dose selected by spontenous locomotor scores). Rodent models were selected to assess behavioral antidepressant and anxiolytic activity viz forced swim test, tail suspension test, hole board assay, open field test, interaction study (with insulin 100IU) and chronic mild unpredictable stress. Mechanistic model namely 5-hydroxy tryptophan induced head twitch response and corticosterone levels were estimated. Conclusively, more potent and novel serotonergic modulators can be the better target for eradication of diabetes associated cognitive disorders such as depression and anxiety.

Biography

Deepali Gupta has completed her Bachelors in Pharmacy from R.G.P.V., Bhopal, M.P. and Masters from BITS-Pilani, Pilani Campus, Rajasthan, India. Currently she is pursuing her PhD from the same campus. Her research work entitled Behavioral and Neuropharmacological Evaluation of Novel Serotonerigic 5HT3 Receptor Antagonists in Diabetes Associated Depression is being carried out, exploring depression as a complication of diabetes. She has active participation in various scientific events and conferences and recently she had received Young Scientist Award and Gold Medal for best poster presentation in Pharmanext-2011 conference proceeding.

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