Therapeutic potential of folic acid in sciatic nerve injury induced cognitive dysfunction in rat model

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Abstract

Diabetes and other vascular injuries are known to cause the neurodegeneration in peripheral as well as central nervous system. The phenomenon of neurodegeneration is also known to cause the neuropathic pain and cognitive dysfunction. Sciatic nerve injury (SNI) has documented to produce the neuropathic pain and cognitive dysfunction. Folic acid is one of the micronutrients for the development and protection of neurodegenerative disorders. The objective of the present study is to investigate the role of folic acid in SNI induced cognitive dysfunction in rat model. SNI clinically mimics the diabetic neuropathy and neurotrauma associated cognitive dysfunction. The cognitive function was assessed by using Morris water maze (MWM) test in terms of escape latency time (ELT) which helped in accessing acquisition (learning) trail and time spent target quadrant (TSTQ) and retrieval (memory) trail. In addition, the biochemical tests such as thiobarbituric acid reactive substances (TBARS), reduced glutathione (GSH), acetyl cholinesterase (AChE) activity and total protein were also estimated in brain tissue sample. The administration of folic acid (10 and 20 mg/kg, p.o.) for 10 consecutive days significantly ($P < 0.05$) attenuated SNI induced by increase ELT and decrease TSTQ levels. Further, it also produces the ameliorative effect on SNI induced raise in TBARS, AChE activity and decrease in GSH levels when compared to sham control group. The study was compared with the treatment of donepezil (standard drug, 1 mg/Kg, p.o.) for 10 consecutive days which has also shown similar effects. Hence, it may be concluded that, folic acid may be a newer candidate for the management of cognitive dysfunction with peripheral nerve injury condition.

Keywords- *Acetyl cholinesterase, Acquisition test, Folic acid, Retrieval test.*

Professional Biography

Ms. Seema Mehdi has completed her Bachelor in Pharmacy and post-graduation in Pharmacology from the College of Pharmacy, JSS Academy of Higher Education and Research, Mysuru. Presently working as a lecturer in the college of Pharmacy, JSS University Mysuru, from past 4yrs. She has published papers and book chapters in reputed journals and books, her area of research is Clinical Pharmacology in the field of neuroscience and to provide health care services. She has attended various national and international conferences, seminars and workshops during her teaching tenure. She has also served as a member in organising committee in 67th Indian Pharmaceutical Congress-2015 and 8th Asian Association of Schools of Pharmacy Conference-2017, held at Jagadguru Sri Shivarathreeswara University (JSS University), Mysuru



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Any Comments: Nil