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Progesterone in the treatment of ischemic stroke

Fahim Atif

Emory University, USA

Transient ischemia accounts for 87% of all strokes. Tissue plasminogen activator is the only FDA-approved drug to treat stroke, but it can be used in at most 5% of stroke patients. This is in part because of its limited 3-4.5-hour time window for treatment, after which its efficacy falls rapidly and in part to its increased risk of blood thinning and bleeding leading to intracranial hemorrhage. There is still no clinically safe and effective neuroprotective treatment that can be given to the remaining 95% of stroke patients. According to the Stroke Therapy Academic Industry Roundtable (STAIR) recommendations, preclinical testing for stroke pharmacotherapies should determine dose-response relationships, extend therapeutic time windows, and test efficacy in multiple stroke models including permanent and transient ischemia, aged animals, and animals with comorbidities. In accordance with the guidelines, we addressed a number of these parameters in our studies using hormone progesterone (PROG). We optimized the most neuroprotective dose of PROG and evaluated optimal therapeutic time window for PROG's neuroprotective effects following ischemic stroke in older rats. We also examined the beneficial effects of PROG treatment in post-stroke infection-induced functional deficits in older rats. Our data strongly suggest that PROG treatment, at a dose of 8 mg/kg, delayed up to 6 hours can improve functional deficits and reduce brain infarction. Our findings indicate that post-stroke infection worsens stroke outcomes and PROG treatment showed beneficial effects. In conclusion, PROG is neuroprotective, has a wide therapeutic window and is beneficial in treating ischemic stroke under co-morbid conditions.

Biography

Fahim Atif completed his PhD at the age of 26 at Hamdard University, and postdoctoral studies at Emory University School of Medicine in Atlanta. He is an Assistant Professor in Emergency Medicine at Emory University. He has published more than 33 papers in reputed journals and served as an editorial board member and reviewer for a number of peer-reviewed journals. His primary research interests lie in the development of a safe and effective treatment for pediatric and adult ischemic stroke, and for neurogenic tumors (neuroblastoma, glioblastoma, astrocytoma) using the neurosteroid progesterone and its metabolite.

fatif@emory.edu