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Anticonvulsant effects of carbamazepine-levetiracetam adjunctive treatment in convulsive status epilepticus rat model: inhibition of cholinergic transmission**Opeyemi Samson Osuntokun¹, Umar Faruq Abdulwahab², Nafisat Omolola Akanji², Kabiru Isola Adedokun², Adedayo Damilare Adekomi², Gbola Olayiwola³**¹Federal University, Nigeria²Osun State University, Nigeria³Obafemi Awolowo University, Nigeria

This study evaluated the anticonvulsant and neuroprotective effects of carbamazepine (CBZ), levetiracetam (LEV), and CBZ + LEV adjunctive treatment in convulsive status epilepticus (CSE) rat model. Twenty-five male Wistar rats were randomized into five groups (n = 5). Groups I and II received 0.2 ml of normal saline intraperitoneally (i.p), while groups III-V received CBZ (25 mg/kg i.p), LEV (50 mg/kg i.p) or combination of sub-therapeutic doses of CBZ (12.5 mg/kg i.p) and LEV (25 mg/kg i.p). Thirty minutes later, seizure was kindled with pilocarpine hydrochloride (350 mg/kg) in group II-V rats. Seizure indices, markers of excitotoxicity, and astroglioses were determined, while the hippocampal morphometry was also evaluated. The data was analysed using descriptive and inferential statistics, while the results were presented as mean \pm SEM in graphs or tables, and the level of significance was taken at $p < 0.05$. The anticonvulsant treatments delayed the inception of seizure indices ($p = 0.0006$), while the percentage mortality decreased significantly ($p = 0.0001$) in all the treatment groups. The hippocampal concentrations of acetylcholine, malondialdehyde, and tissue necrotic factor-alpha decreased significantly ($p = 0.0077$) in all the treated group relative to the positive control. The reactive astrogliosis in the hippocampus (CA 1) increased significantly ($p = 0.0001$) compared with the control but abrogated in all the treatment groups relative to the positive control. The anticonvulsant and neuroprotective effects are in this order: LEV > CBZ + CBZ > CBZ. The drug efficacy is attributable to the inhibition of cholinergic transmission.

Biography

Osuntokun Opeyemi Samson is a Researcher and Lecturer in the Physiology Department of the Federal University Oye Ekiti, Nigeria. Dr Osuntokun obtained his B. Tech degree in Physiology in 2009 and got his master degree in Physiology in 2014. He also obtained his PhD in 2019. His area of research interest is translational neuroscience with bias for the management of epilepsy and the sequela effects of epilepsy and or its treatment on various systemic function. His expertise span from behavioural neuroscience; toxicological investigation; and endocrine assessment with the aid of modern technique such as enzyme-linked immunosorbent assay (ELISA) and immunohistochemistry.