COMBINED MODULATION OF GABAERGIC AND GLUTAMATERGIC PATHWAYS BY RILUZOLE AND CEFTRIAXONE SODIUM IN SEIZURE MANAGEMENT

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ABSTRACT

The current study investigates the combined effect of riluzole, a glutamate release inhibitor, and ceftriaxone sodium, an excitatory amino acid transporter (EAAT) upregulator, in a pentylenetetrazol (PTZ) induced model of epilepsy in rats. The animals were assessed by seizure score, motor coordination, locomotor activity, biochemical markers and histopathology. The combination therapy significantly increased seizure latency and decreased seizure duration compared with the PTZ group. Biochemical analysis revealed a significant reduction in the levels of glutamate and IL-6 and increased gamma-amino butyric acid (GABA) concentration, reflecting the restoration of neurotransmitter balance. Antioxidant markers, superoxide dismutase (SOD) and catalase (CAT), were significantly increased, reflecting the inhibition of oxidative stress. Histopathological analysis confirmed increased neuroprotection in the combination therapy group. The findings suggest that riluzole and ceftriaxone sodium, through their complementary mechanisms, contribute to modulating excitotoxicity and neuroinflammation, offering a potential therapeutic strategy for epilepsy management. Long-term efficacy and clinical applicability should be assessed in further studies.