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Lipoic acid effects on glutamate and taurine concentrations in rat hippocampus after pilocarpine-induced seizures.

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Source

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Abstract

Pilocarpine-induced seizures can be mediated by increases in oxidative stress and by cerebral amino acid changes. The present research suggests that antioxidant compounds may afford some level of neuroprotection against the neurotoxicity of seizures in cellular level. The objective of the present study was to evaluate the lipoic acid (LA) effects in glutamate and taurine contents in rat hippocampus after pilocarpine-induced seizures. Wistar rats were treated intraperitoneally (i.p.) with 0.9% saline (Control), pilocarpine (400 mg/kg, Pilocarpine), LA (10 mg/kg, LA), and the association of LA (10 mg/kg) plus pilocarpine (400 mg/kg), that was injected 30 min before of administration of LA (LA plus pilocarpine). Animals were observed during 24 h. The amino acid concentrations were measured using high-performance liquid chromatograph (HPLC). In pilocarpine group, it was observed a significant increase in glutamate content (37%) and a decrease in taurine level (18%) in rat hippocampus, when compared to control group. Antioxidant pretreatment significantly reduced the glutamate level (28%) and augmented taurine content (32%) in rat hippocampus, when compared to pilocarpine group. Our findings strongly support amino acid changes in hippocampus during seizures induced by pilocarpine, and suggest that glutamate-induced brain damage plays a crucial role in pathogenic consequences of seizures, and imply that strong protective effect could be achieved using lipoic acid through the release or decrease in metabolization rate of taurine amino acid during seizures.

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