

Involvement of nitrenergic system in the anticonvulsant effect of CoQ10 in the pentylenetetrazole-induced clonic seizure in male mice

K. Sheikhnouri*, M. Hassanipour, H. Shafaroodi, Z. Mousavi

Department of pharmacology and toxicology, pharmaceutical science Branch and pharmaceutical science research center, Islamic azad university, Tehran, Iran.

Background and Aims: Coenzyme Q10 (CoQ10) is an essential cofactor in the electron transport system. CoQ10, an antioxidant compound, exhibits a wide range of the therapeutic effects that are attributed to its potent antioxidant capacity. Recent researches have shown that antioxidant compounds may have neuroprotective effect. CoQ10 also prevents hippocampal neuronal death in seizures induced by pilocarpine in rat. There is some evidence that nitric oxide implications for neurodegenerative diseases. In the present study was evaluated whether nitrenergic system is involved in the anticonvulsant effects of CoQ10 in a model of clonic seizure in mice.

Methods: CoQ10(25mg/kg) was administered for 6 days by gavage. Convulsant activity was induced by pentylenetetrazole (PTZ, 0.5 mg/kg) in to the tail vein of male swiss mice(20-30g) with infusion rate 0.5 ml/min.

Results: The seizure threshold significantly was increased by coQ10(25mg/kg, by gavage, daily for 6 days). Acute single injection of the selective inducible NOS (iNOS) inhibitor aminoguanidine (100mg/kg, intraperiton-eal (ip)) with an effective dose of CoQ10 (25mg/kg) inhibited its anticonvulsant effects. The seizure threshold significantly was increased by chronic co-administration of the precursor L-arginine (30mg/kg, ip, daily) with a non-effective dose of CoQ10 (6.25mg/kg), but chronic co-administration of the aminoguanidine (50mg/kg, ip) in 6-day CoQ10(25mg/kg)- treated mice and acute injection of L-arginine (60mg/kg, ip, daily) with a non-effective dose of CoQ10 (6.25mg/kg) did not significantly alter seizure threshold.

Conclusion: CoQ10 increases the PTZ-induced clonic seizure threshold in mice, moreover we suggest that nitrenergic system have a role in the anticonvulsant effect of CoQ10 in this model of seizure in mice.

Keywords: Clonic seizure; Nitrenergic system; Pentylenetetrazol; CoQ10