

Synergistic effect of Docosahexaenoic acid on the anticonvulsant activity of lamotrigine in amygdala kindling seizure model

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Introduction: combination therapy is a common strategy to increase the efficacy and decrease side effects of antiepileptic drugs. Considerable anticonvulsant potential as well as appropriate safety of Docosahexaenoic acid (DHA) makes it a good candidate for combination therapy. In this study we evaluated the influence of DHA on the anticonvulsant activity of one of the common antiepileptic drugs (AEDs), lamotrigine, in kindling model of epilepsy in rats.

Methods: Dose-antiseizure curve for lamotrigine (60 min after i.p. injection of doses 10, 12.5, 15, and 20 mg/kg to rats) against complex partial seizures induced by amygdala-rapid kindling was obtained. DHA was injected at doses 1, 300 and 1000 μ M in kindling model and DHA anti-seizure effect examined in this model, 15 min after intracerebroventricular (i.c.v.) injection.. Then a non-protective dose of DHA 300 μ M (ED25(Effective Dose of 25%)) was added to increasing doses of lamotrigine and new dose-antiseizure curve was obtained.

Conclusion: Co-administration of the safe and inexpensive anticonvulsant agent DHA, with common AEDs can be considered as a good strategy in treatment of epilepsy.

Results: DHA showed dose-dependent protective effect against kindled seizure (1087.824 μ M). DHA at ED25 caused 4.938 fold increase in potency of Lamotrigine (ED50 value from 13.10 decreased to 2.65 mg/kg). Compusyn analysis indicated synergistic anticonvulsant interaction between DHA and Lamotrigine.

