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Synergistic effect of Docosahexaenoic acid on the anti-convulsant 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 Anti-Epileptic Drugs (AEDs), lamotrigine, in the 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 intra-cerebroventricular (i.c.v.) injection. Then a non-protective dose of DHA 300 μ M (ED25) was added to increasing doses of lamotrigine and new dose-antiseizure curve was obtained.

Results & Conclusion: DHA showed dose-dependent protective effect against kindled seizure (1087.824 μ M). DHA at ED25 caused 4.938 fold increases 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. As a result, co-administration of the safer and inexpensive anticonvulsant agent DHA, with common AEDs can be considered as a good strategy in the treatment of epilepsy.

Biography

Gavzandaroukola Hakimeh had completed her BVM from Shahid Chamran University and PhD of physiology from Tehran University Faculty of Veterinary. Her PhD thesis was "Evaluation of behavioral and electrophysiological effects of the unsaturated fatty acid DHA in experimental model of seizures". She performed her PhD thesis in Pasteur Institute of Iran, Tehran. She is teaching physiology in Amol University of special modern technology. She had 2 papers: "Effect of Echinacea purpurea on antibody production against fowl influenza" and "Synergistic effect of docosahexaenoic acid on anticonvulsant activity of valproic acid and lamotrigine in animal seizure model". Also she had given several oral presentations and posters in some international conferences.

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