



Effect of an ectonucleotidase inhibitor on anticonvulsant actions of low-frequency electrical stimulation in perforant path rapid kindling in rats

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Abstract

Introduction: Considering high prevalence of epileptic disease and considering that 40 percent of epileptic patients are resistant to drug therapy, it needs more researches to find new therapeutic ways. LFS is among the new methods for epilepsy treatments. One possible mechanism involved in the anticonvulsant effect of LFS is increased adenosine. Therefore, in this study the role of adenosine production from ATP by ectonucleotidase enzyme pathway in exerting the anticonvulsant effects of LFS were evaluated.

Methods: Animals were kindled by electrical stimulation of perforant path in a rapid kindling manner (12 stimulation per day). One group of animals received LFS after kindling stimulation. In one another group, AOPCP a blocker of ectonucleotidase inhibitor was micro injected (50 micro molar) intra cerebro ventricular each day before LFS stimulation. Some group of animals were also received AOPCP (50 and 100 micro molar) but were not applied to LFS. Seizure behavior and electrophysiological parameters (including ADD and field potential) were recorded.

Results: Like previous investigations, application of LFS, decreased all seizure parameters significantly. Microinjection of AOPCP had no significant effect on anticonvulsant actions of LFS. However microinjection of AOPCP at doses of 100 micro molar in animals that received just kindling stimulations, increased the seizure parameters significantly.

Conclusion: The results show that adenosine production via ectonucleotidase enzyme pathway may has no role in anticonvulsant effects of LFS; however endogenous adenosine produced through this pathway has an important role in kindling development.

Key words: Seizure, Low frequency stimulation, Adenosine, AOPCP

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