



Effect of caffeine on the anticonvulsant effects of oxcarbazepine, lamotrigine and tiagabine in a mouse model of generalized tonic-clonic seizures

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Abstract:

Caffeine has been reported to be proconvulsant and to reduce the anticonvulsant efficacy of a variety of antiepileptic drugs (carbamazepine, phenobarbital, phenytoin, valproate and topiramate) in animal models of epilepsy and to increase seizure frequency in patients with epilepsy. Using the mouse maximal electroshock model, the present study was undertaken so as to ascertain whether caffeine affects the anticonvulsant efficacy of the new antiepileptic drugs lamotrigine, oxcarbazepine and tiagabine.

The results indicate that neither acute nor chronic caffeine administration (up to 46.2 mg/kg) affected the ED₅₀ values of oxcarbazepine or lamotrigine against maximal electroshock. Similarly, caffeine did not modify the tiagabine electroconvulsive threshold. Furthermore, caffeine had no effect on oxcarbazepine, lamotrigine and tiagabine associated adverse effects such as impairment of motor coordination (measured by the chimney test) or long-term memory (measured by the passive avoidance task). Concurrent plasma concentration measurements revealed no significant effect on lamotrigine and oxcarbazepine concentrations. For tiagabine, however, chronic caffeine (4 mg/kg) administration was associated with an increase in tiagabine concentrations.

In conclusion, caffeine did not impair the anticonvulsant effects of lamotrigine, oxcarbazepine, or tiagabine as assessed by electroconvulsions in mice. Also, caffeine was without effect upon the adverse potential of the studied antiepileptic drugs. Thus caffeine may not necessarily adversely affect the efficacy of all antiepileptic drugs and this is an important observation.

Key words:

antiepileptic drugs, lamotrigine, oxcarbazepine, tiagabine, caffeine, electroconvulsions
