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Poster Presentation

Study the Effect of Carbamazepine During the Epileptogenesis by Dorsal Hippocampal Kindling on Balance and Locomotor Activity in Adult Male Rats

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Abstract

Epilepsy is a chronic cerebral disorder associated with recurrently occurring seizures resulting from over activity of brain neurons. Since more than one percent of the world's population is suffering from epilepsy, this disease is recognized as one of the most important neurological disorders in modern medicine. Studies indicate that impairment in balance and motor activity are known as one of the side effects of epilepsy. Therefore, the use of an antiepileptic drug such as carbamazepine can help to improve these disorders. So, in this research, the effect of carbamazepine during epileptogenesis in dorsal hippocampal kindling on balance and motor activity in adult male rats was investigated. In this study, 60 adult male rats were randomly divided into 6 groups: surgical control, methylcellulose (MC), Kindled, carbamazepine (CBZ), kindled-carbamazepine (KCBZ) and the methylcellulose-Kindled (MCK). Animals in the Kindled group stimulate were rapidly kindled by daily stimulation of dorsal hippocampus (12 stimulation per day, 1 ms pulse duration at 50Hz for 3 seconds) in the dorsal hippocampus region(CA1). While animals in the control groups did not receive any stimulation. Animals in the CBZ group received 8 mg of carbamazepine intraperitoneally on the first day after the recovery. The CBZK-group, in addition to receiving 8 mg of carbamazepine on the first day after recovery, received kindling stimulations for 6 days, as the same method with Kindled group. The MCK-group was similar to the CBZK-group with this difference that they received MC instead of CBZ. At the end of kindling stimulation, open field and rotarod tests were respectively used to examine the effect of CBZ on motor activity and balance. The open field test results showed a significant decrease in the motions and rearing frequency in the CBZK-group compared to the MCK-group ($p < 0.01$). Frequency of rearing and motions in the Kindled group also showed a significant increase compared to the control group ($p < 0.01$). Grooming in the CBZK-group compared to the MCK-group show significant decrease ($p < 0.05$) and in the Kindled group showed a significant increase compared to the control group ($p < 0.05$). In the Rotarod test, the balance in the Kindled group was significantly lower than the control group ($p < 0.05$) and in the CBZK-group compared to the MCK-group show significant increase ($p < 0.01$). It seems that Carbamazepine injection during the epileptogenesis by dorsal hippocampal kindling in male rats reduces motor activity but improves balance.

Keywords: Hippocampal Kindling, Carbamazepine, Balance, Motor Activity, Rotarod Test, Open Field Test, Rat

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