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The Possible Neuroprotective Effects of Cannabidiol in Post-Status Epilepticus Rat Model of Temporal Lobe Epilepsy

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ABSTRACT

Background: A non-psychoactive phytocannabinoid, cannabidiol (CBD), shows promising results as a potential effective anti-epileptic drug in some forms of refractory epilepsy. It is proved to have a role in improving cognitive dysfunction and associated epilepsy comorbidities. However, the exact mechanism behind its neuroprotective effect is not thoroughly investigated.

Aim: The aim of the current study was to clarify whether CBD has a modifying effect on the behavior of post-Status Epilepticus (post-SE) rat model of temporal lobe epilepsy and the suspected role of hippocampal 5HT1A receptors expression in that respect.

Methodology: A total of 30 rats were randomized into 3 groups (n=10): control, post-SE and post-SE+CBD groups. Post-SE group was given pilocarpine hydrochloride 300 mg/kg intraperitoneally (i.p) proceeded by atropine nitrate 1 mg/kg i.p. SE was terminated after 90 min of induction by diazepam (10 mg/kg i.p). Post-SE+CBD group was treated with CBD 20 ug/kg after SE induction for 27 days. Rat's behavior was studied through Morris Water Maze (MWM) and open field tests followed by their scarification. Brain histopathology and hippocampal 5HT1A expression were evaluated as well.

Conclusion: Our data suggested that CBD improved post-SE cognitive dysfunction and showed anxiolytic effect through modifying hippocampal 5HT1A expression. It ameliorated brain histopathology induced by SE as well.

Keywords: Pilocarpine, Post-status epilepticus, Cannabidiol, 5HT1A, Rats

Abbreviations: CBD: Cannabidiol; i.p: intraperitoneally; MWM: Morris Water Maze; post-SE: post-Status Epilepticus

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