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Poster Presentation

The Role of Neuronal Nitric Oxide Synthase on the Anti-Seizure Effects of 5-HT1A Receptors in Perforant Pathway Kindling Model in Rat

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Abstract

Neuronal nitric oxide synthase (nNOS) plays a role in synaptic potentiation and kindling process. The relationship between nNOS and 5-HT1A receptors also nearly has been specified. In this research, we investigate the role of nNOS on the anticonvulsant effect of 5-HT1A receptors. 24 male (280 ± 30 g) were randomly assigned to four groups (vehicle, NI, Way 100635 and NI + Way 100635) ($n = 6$). Animals received one of the above compounds 30 min before application of the kindling stimulus. In the NI + Way 100635 group, 10 min later Intra ventricle injection Way 100635, intraperitoneal nitroindazole (NI) was injected. After application daily stimulation (12 times a day, with a 5 minute interval), up to five days, the seizure and electrophysiological quantities (after discharge duration and local field potentials) were recorded and measured. Data analysis showed that the Way 100635 and NI + Way groups were kindled significantly faster than the vehicle group ($P < 0.001$). The changes in afterdischarge duration increased in the NI + Way group over the five days when compared to the control group, but was not significant ($P > 0.05$). Also, the slope of field potentials in the NI + Way group was significantly higher than that of the vehicle group ($P < 0.05$). Likely, nNOS is one of the mediators of the inhibitory effect of serotonin 5-HT1A receptors, and activating this pathway augments the anticonvulsant effects of serotonin.

Keywords: Serotonin, Kindling, Nitric Oxide Synthase, Seizure

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