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Quantitation of Neuronal Loss Induced by Status Epilepticus and the Effects of Nitric Oxide

Güldal GÜLEÇ
Behzat NOYAN
Department of Physiology, Faculty of Medicine,
Uludag University, Bursa-TURKEY

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Authors

medsci@tubitak.gov.tr

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Abstract: Neuronal loss in the hippocampal CA1 and CA3 fields due to lithium-pilocarpine- induced status epilepticus (SE) and the effects of a nitric oxide (NO) substrate, L-Arginine and a NO synthase inhibitor, N_w -nitro-L-Arginine methyl ester (L-NAME) on SE-induced brain damage were determined using the neuron counting procedure in rats. Rats were implanted with four chronic, epidural screw electrodes in order to obtain electrocortical recordings. SE was determined from the electrocortical recordings. After decapitation, the brains were removed, and the hippocampal sections were obtained and stained with hematoxylin and eosin. An analysis of variance (ANOVA) and Student's t- test were used for statistical purposes. The normal pyramidal neuron numbers of rats which had exhibited SE were significantly lower than those of rats that had not displayed SE. Both L-Arginine and L-NAME increased the neuronal loss induced by SE. We concluded that lithium-pilocarpine-induced SE leads to neuronal loss in the hippocampal CA1 and CA3 fields. L-Arginine and L-NAME, which were expected to show opposite actions, acted in a similar manner at the given doses.

Key Words: Lithium-pilocarpine, Status epilepticus, L-Arginine, L-NAME, Neuron loss.

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