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The effect of l-arginine and l-NAME on pentylenetetrazole induced seizures in ovariectomized rats, an in vivo study

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View references (٥١)

Abstract

The role of ovarian hormones and nitric oxide (NO) on seizure and their interaction have been widely investigated. The present study carried out to evaluate the effect of chronic administration of l-arginine (lA) and l-NAME (lN) on pentylenetetrazole (PTZ) induced epilepsy in ovariectomized (OVX) and naïve female rats. Fourty-eight female rats were randomly divided into six groups (n = ٨) as follows: (١) sham, (٢) ovarectomized (OVX), (٣) sham-lA, (٤) sham-lN, (٥) OVX-lA, and (٦) OVX-lN. The animals of sham-lA and OVX-lA received daily injection of ٥٠٠ mg/kg l-arginine (i.p.) during ٤ weeks. Sham-lN and OVX-lN were treated by ١٠ mg/kg l-NAME (i.p.) daily for ٤ weeks. The animals of sham and OVX groups received ١ ml/kg saline (i.p.) instead of l-arginine and l-NAME. The latencies to minimal clonic seizures (MCS) and generalized tonic-clonic seizures (GTCS) after intraperitoneal injection of penetylenetetrazole (PTZ, ٩٠ mg/kg) was recorded and compared between groups. A significant increase in the GTCS, but not MCS, latency was seen in OVX rats in comparison with sham-operated animals. Pretreatment of animals with l-NAME resulted in a significant increase in the GTCS and MCS latencies in sham group while no significant effects were seen in OVX rats. On the contrary, while pretreatment with l-arginine had no effects on MCS and GTCS latencies in sham group, a significant decrease in GTCS latency was observed in OVX rats. It is concluded that ovarian sex hormones affect seizure thresholds induced by PTZ and NO has a role on seizures susceptibility following PTZ administration. This NO effect might be differing in the presence or absence of ovarian hormones, but further investigations need to be done. © ٢٠٠٩ British Epilepsy Association.

Author keywords

l-Arginine; l-NAME; Ovariectomy; Penetylenetetrazole (PTZ); Rat; Seizure

Indexed Keywords

EMTREE drug terms: arginine; n(g) nitroarginine methyl ester; pentetrazole; sodium chloride

EMTREE medical terms: animal experiment; animal model; article; clonic seizure; controlled study; drug effect; epilepsy; female; in vivo study; nonhuman; ovariectomy; priority journal; rat; seizure threshold; sham procedure; tonic clonic seizure; treatment duration

MeSH: Analysis of Variance; Animals; Anticonvulsants; Arginine; Disease Models, Animal; Enzyme Inhibitors; Female; NG-Nitroarginine Methyl Ester; Ovariectomy; Pentylenetetrazole; Rats; Rats, Wistar; Seizures
Medline is the source for the MeSH terms of this document.

Chemicals and CAS Registry Numbers: arginine, ١١١٩-٣٤-٢, ١٥٥٩٥-٣٥-٤, ٧٠٠٤-١٢-٨, ٧٤-٧٩-٣; n(g) nitroarginine methyl ester, ٥٠٩٠٣-٩٩-٦; pentetrazole, ٥٤-٩٥-٥; sodium chloride, ٧٦٤٧-١٤-٥;Anticonvulsants; Arginine, ٧٤-٧٩-٣; Enzyme Inhibitors; NG-Nitroarginine Methyl Ester, ٥٠٩٠٣-٩٩-٦; Pentylenetetrazole, ٥٤-٩٥-٥
Manufacturers:Drug manufacturer: Sigma, United States.

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