Zhumeria majdae essential oil anticonvulsant effect on intraperitoneally pentylenetetrazole-induced seizure and Maximal Electroshock seizure model

Helia aghamiri¹, Hamed Shafaroodi¹, Jinous Asgarpanah²

1. Department of Pharmacology and Toxicology, Pharmaceutical Sciences Branch and Pharmaceutical Sciences Research Center, Islamic Azad University, Tehran, Iran.
2. Department of Pharmacognosy, Pharmaceutical Sciences Branch and Pharmaceutical Sciences Researches Center, Islamic Azad University, Tehran, Iran.

Abstract: Zhumeria majdae rech (labiates) is a perennial fragment shrub native to the southern parts of Iran. It has long been used in traditional medicine as antimicrobial, antispasmodic and anticonvulsant agent. The present study was conducted to evaluate the anticonvulsant effect and the probable mechanism of action of essential oil from aerial parts of Z. majdae.

Plant material:
Zhumeria majdae was taken from Bandar-Abbas in Hormozgan and were submitted to hydrodistillation in a clevenger-type apparatus. Identification of the oil constituents was performed by GC/MS analysis.

PTZ-induced seizure:
Different doses of Z. Majdae essential oil (5, 20, 40 mg/kg) and Diazepam (0.025, 0.05, 0.1 mg/kg) were administered intraperitoneally in different group of male mice one hour before the i.p injection of PTZ (85 mg/kg). Mice were observed for 3 parameters (the latency time before the onset of clonic seizure, frequency of clonic seizures and mortality) up to 30 min after ptz administration.

Maximal Electroshock seizure (MES) model:
The electrical stimulus (35 mA, 50 Hz, 0.2 sec duration) was applied through ear-clip electrodes to 3 groups of 10 mice each previously treated i.p with doses of 20, 40 mg/kg Z. majdae essential oil and 25 mg/kg phenytoin sodium respectively. The percentage of animals showing abolition of the Hind Limb Tonic Extension (HLTE) was calculated.

Acute administration of Zhumeria Majdae (20, 40 mg/kg) significantly reduced frequency of clonic seizures and mortality rate caused by PTZ-induced clonic seizures compared to the vehicle-treated group (sweet almond oil). Combination of non-effective doses of Z. majdae (5 mg/kg) and diazepam (0.025 mg/kg) had an additive effect on increasing the latency to clonic convulsions (that can be reversed by administration of flumazenil (BZD antagonist) compared to each one individually and vehicle-treated group.

In conclusion, Z. majdae shows anticonvulsant effect suggesting the involvement of GABA-A receptor.

Keyword: seizure, Zhumeria Majdae, pentylenetetrazole, Maximal Electroshock