

Research article

## Anticonvulsant activity of some semicarbazone and thiosemicarbazone derivatives of isatin on PTZ induced seizure

Masoumeh Divar<sup>1</sup>, Yasaman Yeganeh<sup>2</sup>, Akram Jamshidzadeh<sup>1,2</sup>, Reza Heidari<sup>1,2</sup>, Soghra Khabnadideh<sup>1\*</sup>

<sup>1</sup>Pharmaceutical Science Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

<sup>2</sup>Department of Pharmacology and Toxicology, Faculty of Pharmacy, Shiraz University of Medical Sciences, Shiraz, Iran.

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**\*Corresponding Author: Soghra Khabnadideh**, Pharmaceutical Science Research Center, Shiraz University of Medical Sciences, Shiraz, Iran.

### Abstract

Epilepsy is a syndrome characterized by excessive discharge of many neurons. In spite of the optimal use of available antiepileptic drugs; seizures in lots of patients fail to be controlled. On the other hand many patients experience side effects which can limit the use of these drugs. Hence, investigation on chemicals with anticonvulsant properties and lower side effects are a valuable task. Isatin is a heterocyclic compound with different biological properties. We synthesized 14 isatinsemicarbazone and thiosemicarbazone derivatives (**a-n**) in our previous study. Here we are going to evaluate these compounds for their anticonvulsant effects.

We performed Pentylene tetrazole (PTZ) model (acute) in male mice (85mg/kg) and chemical kindling model (chronic) in male rats (37.5 mg/kg each 48 h for 14-20 days). Intraperitoneal injection was used to induce seizures in rodents.

In the acute test, compounds **b, d, f, i, j, k, l, m** and **n**, with 3 doses of 10, 20 and 30 mg/kg showed significant anticonvulsant effects in comparison to the control group and increase the seizure onsets and the time of death ( $p < 0.05$ ). In the kindling model, derivatives **k** and **n** were selected as effective compounds with doses of 10, 30 mg/kg. These derivatives significantly prevented the epileptogenesis and improved motor coordination in Rotarod test. In conclusion, these compounds seem to be potential anticonvulsant agents with low side effects.