

## EFFECT OF ZONISAMIDE ON CHRONIC CONSTRICTION INJURY INDUCED NEUROPATHIC PAIN IN MALE SD RATS

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Received: 20 April 2013,

Revised and Accepted: 30 April 2013

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### ABSTRACT

There is considerably research evidence supporting a palliative role for voltage-gated sodium and T-type calcium channels in neuropathic pain conditions. Hence, the present study was undertaken to assess the ability of zonisamide (a sodium and T-type calcium channel blocker) to relieve various symptoms of neuropathic pain in the chronic constriction injury rat model of neuropathic pain. Zonisamide (80 & 50 mg/kg) or saline was administered in a blinded, randomized manner by intraperitoneal injection from postoperative day (POD) 7 to 13. Paw withdrawal duration (PWD) to spontaneous pain, chemical allodynia and mechanical hyperalgesia, and paw withdrawal latency (PWL) to mechanical allodynia and thermal hyperalgesia were tested before surgery, before and after zonisamide or saline administration (from POD7 to 13) and after the withdrawal of treatment (from POD14 to 36). Systemic zonisamide relieved neuropathic pain symptoms in a dose dependent manner. All PWDs were significantly decreased and PWLs were significantly increased after zonisamide administration compared with saline control measurements. However, zonisamide had non-uniform effect on chemical allodynia. Results of zonisamide were also compared with standard drug pregabalin (50 & 30 mg/kg) and found that zonisamide should be considered as an alternative pharmacological tool for treatment of neuropathic pain that is largely refractory to standard analgesics such as pregabalin.

**Key words:** Neuropathic pain, Allodynia, Hyperalgesia, T-type  $Ca^{2+}$  channel, Zonisamide, Pregabalin