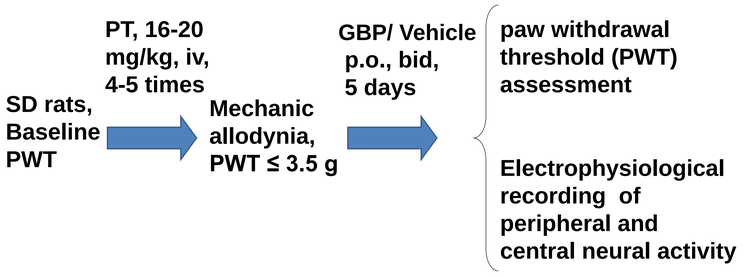
BEHAVIOURAL AND ELECTROPHYSIOLOGICAL STUDY ON A RAT MODEL OF PACLITAXEL-INDUCED NEUROPATHY

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BACKGROUND: Paclitaxel (PT) is one of the major chemotherapy drugs for a variety of cancers. However, one of the common side effects is neuropathic pain which happens in about half of the patients receiving PT treatment. The treatment of this neuropathy, as with other types of neuropathic pain, is so far not satisfactory. Rodent models of paclitaxel-induced neuropathic pain have previously been reported, though the reliability of this model requires further improvement. In this study, we aimed to develop a stable rat model of paclitaxel-induced neuropathic pain for assessment of anti-neuropathic compounds.

METHODS:



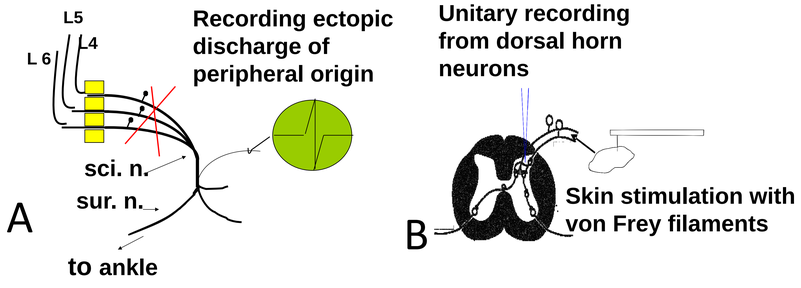


Figure 1. Schematic diagram showing the protocols for electrophysiological recording of peripheral ectopic discharge of sural nerve filaments (A, sur. N.) and unitary discharge at spinal cord dorsal horn (B) in the PT model rats.

RESULTS:

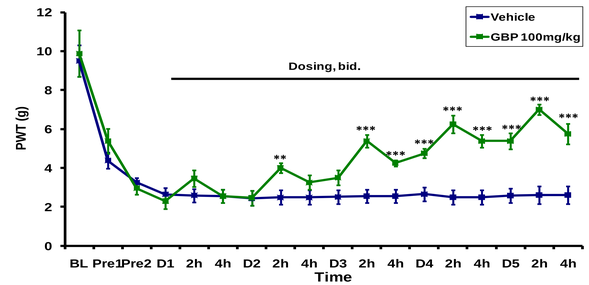


Figure 2. Effects of Gabapentin on PWT in paclitaxel-induced pain model rats during the 5-day dosing course.

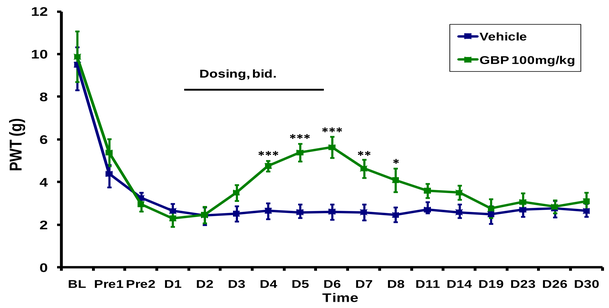


Figure 3. Effects of Gabapentin on baseline PWT in paclitaxel-induced pain model rats monitored for 30 days following dosing.

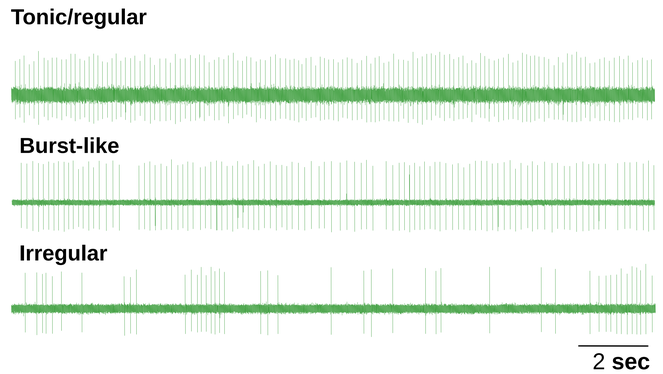


Figure 4. Characteristic ectopic discharge of sural nerve filaments in the PT model rats. The spontaneous activity is more often observed in peripheral nerve ends (ref. Figure 1A) than central ends.

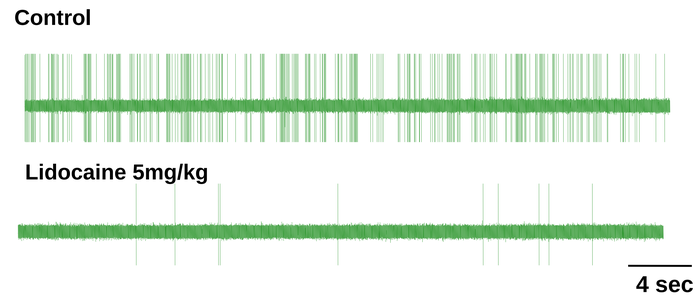


Figure 5. The ectopic discharge of sural nerve filaments was inhibited by some compounds such as local anaesthetic lidocaine.

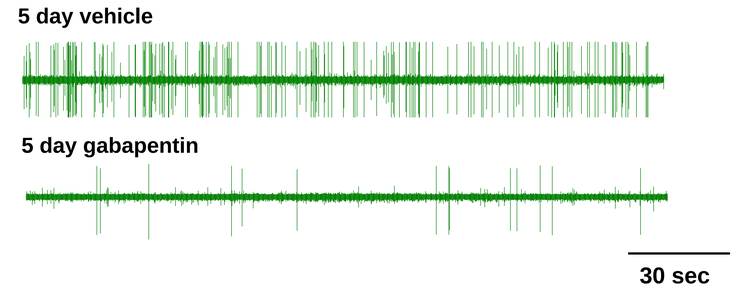


Figure 6. Unitary recording from spinal cord dorsal horn (ref. Figure 1B) in PT model rats. The firing frequency of WDR and HTM neurons in gabapentin-treated rats were lower than that in vehicle-treat counterparts.

CONCLUSION:

1. The rat model of paclitaxel-induced neuropathy has characteristic behavioural and electrophysiological features consistent with sensitization of peripheral and central nervous systems;
2. This model provides a good therapeutic window for behavioural and electrophysiological assessment of novel anti-neuropathic compounds.

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