MASTER'S THESIS

Treatment of neuropathic pain: by Chinese scorpion (Buthus martensii Karsch)

Wong, Shing Chau

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Treatment of Neuropathic Pain

by

Chinese Scorpion (*Buthus martensii* Karsch)

WONG Shing Chau

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ABSTRACT

Background: Chinese Scorpion (*Buthus martensii* Karsch, Bmk) has long been used for the treatment of various nervous system diseases such as apoplexy, epilepsy, facial paralysis and chronic pains. However, its analgesic effect and underlying mechanisms remain to be delineated. The current study aims at studying the potential analgesic effect of Bmk and its mechanism in a rat model of neuropathic pain. **Methods:** One week after L5 spinal nerve ligation (SNL), rats were fed daily for 21 days with either the extract of Bmk or distilled water as a control. Behavioral tests on mechanical and cold hypersensitivity were performed regularly by applying electronic von Frey filament and 100% acetone respectively to the ipsilateral hind-paws of the rats. L4/L5 dorsal root ganglia (DRG) samples were collected at the end of experiment for the assessment of the level of sodium channels by RT-PCR and immunohistochemistry. **Results:** Comparing with the control group, Bmk treatment significantly improved the paw withdrawal behavior of the SNL rats to tactile but not to cold stimulus. The level of Na_v 1.8 was found changed in the L5 DRG of the Bmk-treated rats. **Conclusion:** The whole Bmk extract could significantly alleviated the mechanical hypersensitivity in neuropathic SNL rats in a time- and dose-dependent manner, and this effect could be intricately related to changes in voltage gated sodium channels (VGSCs), in particular $Na_v1.8$ in DRG neurons. The mechanism behind this Bmk analgesic effect could be a combination of the VGSCs regulating peptides and other possible active components contained in the agent.

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