THE EXPRESSION OF TANDEM PORE DOMAIN K+ CHANNEL TRESK IS RELATED TO THE NEUROPATHIC PAIN IN THE RATS OF SPINAL NERVE LIGATION

W.H. Lee[1], Y.K. Ko[1], E. Zhang[1], D.W. Kim[2]

[1]Department of Anesthesiology and Pain Medicine, School of Medicine, Chungnam National University; [2]Department of Anatomy, School of Medicine, Chungnam National University, Daejeon, Korea*

Introduction: Outward K+ current through the two-pore-domain potassium ion channels (K2P) suppress cell excitability by hyperpolarizing the cell membrane. Recently reported TWIK-related spinal cord K+ channel (TRESK) is highly expressed in the neuronal tissue and is assumed to be associated with neuronal hyperexcitability, which is the basic mechanism of neuropathic pain. We have studied the relation between TRESK and neuropathic pain by examining the changes in the expression of TRESK in a pain model (lumbar spinal nerve ligation model, SNL model).

Method: The L5 transverse process wits carefully removed with it small rongeur to identify visually the L5-L6 spinal nerves. The left L5 and L6 spinal nerves were isolated and tightly ligated with 3-0 silk thread. Real time PCR, immunohistochemistry and double immunofluorescence for TRESK were performed in spinal dorsal horn. The experimental procedures were performed in accordance with the animal care guideline of the Korean Academy of Medical science.

Results: Sustained mechanical allodynia was confirmed 3 days after lumbar spinal nerve ligation. TRESK expression in RT PCR and immunohistochemsiry were significantly increased in the ipsilateral spinal dorsal horn 14 days after SNL when compared with the sham group. Double immunofluorescence staining in the ipsilateral lumbar spinal dorsal horn between TRESK and a neuronal marker/an astrocyte marker showed that TRESK were mainly located in neurons, but not astrocytes 14 days after SNL rats.

Conclusion: Our results strengthen the relation between TRESK expression and neuropathic pain in the rats of spinal nerve ligation.