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The effects of neurokin1 receptor antagonist for arthritic pain in a rat model of osteoarthritis

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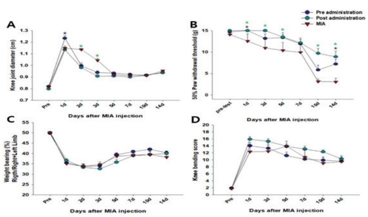
Statement of the Problem: Osteoarthritis (OA) cause inflammation in the joint and is a common degenerative disease in elderly people. Chronic pain is a main symptom in OA patients. However, medications for OA pain limited effects due to the side effects depending on long- lasting usage. Substance P is a neuropeptide release from nociceptive afferent fiber to peripheral and central nervous system that is responsible for neurogenic inflammation and pain transmission through the activation of neurokinin 1 (NK1) receptor. This study was designed to examine a possibility for the NK1 receptor antagonist to be a therapeutic agent for OA pain.

Methodology & Theoretical Orientation: Knee joint inflammation was induced by intra-articular injection of monosodium iodoacetate (MIA, 2mg/50ul). NK1 receptor antagonist (TOCRIS, GR92334, 10uM/30ul) injected before (Pre group) and after MIA injection (Post group). To assess edema, the knee joint diameter was measured by caliper. Paw withdrawal threshold (PWT) was used by von Frey filament to measure mechanical hypersensitivity, and weight bearing test, knee bending test were performed to evaluate the pain during knee joint move.

Findings: Both pre- and post-administration of NK1 receptor antagonist significantly reduced edema in ipsilateral hind-limb on days 2 and 3 after MIA injection. Significant decrease of PWT caused in the MIA group was observed from days 10. However, a single injection of NK1 receptor antagonist into the knee joint inhibited to develop mechanical allodynia in both PRE and POST groups. However, NK1 receptor antagonist in both PRE and POST group did not produce any significant changes in reduced weight bearing and increased knee joint score on the ipsilateral hind-limb after MIA injection compared with the MIA only group. Conclusion & Significance: Administration of NK1 receptor antagonist in early stage of OA inhibited the initiation of chronic pain through alleviation of inflammatory responses in the joints.



Effects of NK1 receptor antagonist in the behavior of OA rats. Behavior tests were performed on pre-, 1, 3, 5, 7, 10, 14 days of MIA injection. (A) Edema was examed by measuring knee joint diameter (B) Paw withdrawal threshold was measured to test mechanical allodynia. (C) [ipsilateral weight / (ipsilateral + contralateral weight) * 100] present weight distribution. (D) Knee bending test was performed to measure knee bending score. (*) : MIA only vs Pre injection group, (*) : MIA only vs Post injection group, . All of this is p<0.05

Biography

Junesun Kim is P.T. and Ph.D. in Physiology. She is a professor at Department of Physical Therapy Korea University College of Health Science. Her major fields of academic interest are the peripheral and central mechanisms of chronic pain, and regenerative mechanisms governing spinal cord injury. She has several publications in in peer-reviewed journals. She provides continuing education lectures regarding neurological physical therapy for SCI and mechanisms of chronic and pathologic pain to student majoring in rehabilitation science at graduate program.

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