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### Effect of GaAlAs Laser and Acupuncture Therapy at BL40 on Neuropathic Pain in Rats

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#### Abstract

**Objectives:** We studied the effects of GaAlAs (808 nm) low-level laser therapy (LLLT) and of acupuncture theory (AT) at BL40 on neuropathic pain induced in rats by lumbar spinal nerve 5 ligation.

**Methods:** To produce the model of neuropathic pain, we ligated the lumbar spinal nerve 5 under isoflurane 2.5% anesthesia by using 6-0 silk thread. After neuropathic surgery, we examined the animals to determine if they exhibited the behavioral sign of allodynia. The allodynia was assessed by stimulating the medial malleolus with a von Frey filament or with acetone. Three weeks after the neuropathic surgery, GaAlAs (808 nm) LLLT and AT were applied at BL40 once a day for 6 days. We examined the withdrawal response of the neuropathic rats' legs by using a von Frey filament or acetone stimulation. Also, the author examined c-Fos, nociceptin and nociceptin receptor in the midbrain central gray matter of neuropathic rats.

**Results:** The GaAlAs (808 nm) LLLT and AT at BL40 decreased the withdrawal response of mechanical allodynia as assessed with a von Frey filament in the LLLT group by 5 and 6 times and as assessed with acetone in the AT group and the LLLT groups by 6 times. LLLT and AT at BL40 decreased the c-Fos protein expression in both the AT and the LLLT groups. The 808-nm LLLT and AT at BL40 decreased the nociceptin protein and nociceptin receptor protein in the LLLT group.

**Conclusion:** We have noticed that GaAlAs (808 nm) LLLT and acupuncture at BL40 decreased mechanical allodynia in the model of neuropathic pain. c-Fos, nociceptin and nociceptin receptor expressions in the central gray matter of that group was also decreased. This study can be used as a basic resource for the study and the treatment of pain.

**Key Words:** neuropathic pain; GaAlAs (808 nm) low level laser therapy (LLLT); c-Fos; nociceptin; nociceptin receptor

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### Effects of Acupressure on Vertebral Artery Blood Flow in Tension-type Headache Patients

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#### Abstract

**Objectives:** The purpose of this study was to examine the effects of apply acupressure to acupuncture points (study group) and interferential current therapy (ICT) to the cervical region (control group) on the cerebral blood flow in 20 tension-type headache patients and on the reduction of their headaches. For this purpose, clinical research was conducted for three weeks on these two groups, each containing 10 patients.

**Methods:** We stimulated seven acupuncture points for headache with acupressure (for three weeks) and applied ICT to the cervical region. Also, we measured the VAS (Visual Analogue Scale) and the blood flow in the vertebral arteries by using TCD (transcranial doppler ultrasonography).

**Results:** (1) When the left and the right vertebral arteries of the study group were compared, significant differences were found after the 1st treatment ( $p < .001$ ). Also, significant differences were found after 2 and 3 weeks of treatment ( $p < .05$ ).

(2) The Visual Analog Scale of the study group were recorded periodically, and significant reductions were found after 1 week of treatment ( $p < .05$ ). Significant differences were also found after 2 and 3 weeks of treatment ( $p < .001$ ). In the case of the control group, significant reductions were found after 2 and 3 weeks of treatment ( $p < .001$ ).

**Conclusion:** Acupressure applied to acupuncture points reduced the headache and increased the rate of cerebral blood flow.

**Key Words:** acupressure, vertebral artery, tension-type headache, TCD

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