P 3-75

EFFECTS OF PAIN SCRAMBLER THERAPY FOR THE ALTERATIONS OF CEREBRAL BLOOD VOLUME IN PAIN NETWORK

So Young Joo[1*], Yoon Soo Cho[1], Suk Hoon Ohn[2†], Cheong Hoon Seo[1†]

Hangang Sacred Heart Hospital, College of Medicine, Hallym University, Seoul, Korea, 1Department of Rehabilitation Medicine[1]

Introduction

Prevalence of chronic pain has been shown to be high after thermal injury. Post-burn neuropathic pain causes chronic disabilities that is often difficult to treat effectively. Pain Scrambler therapy is a patient-specific electrocutaneous nerve stimulation device. To study changes in the pain network associated with neuropathic pain, magnetic resonance imaging(MRI) was used to evaluate cerebral blood volume(CBV) in patients who had been injuried by burn.

Method

Participants (N=10) comprised patients with neuropathic pain after thermal injury. The subjects complained of severe neuropathic pain that was rated at least 5 on the visual analogue scale (VAS), despite treatments with gabapentin medication and other physical modalities. Each Scrambler therapy with the MC5-A Calmare® therapy device (Competitive Technologies, Inc. Fairfield, USA) was performed for 40 min daily (Monday through Friday) for 10 consecutive days. The stimulus was increased to the maximum intensity bearable by the individual patient without causing any additional pain or discomfort. The intensity of neuropathic pain was measured using the visual analogue scale(VAS). Depressive mood was assessed using the Beck Depression Scale(BDS). Voxel-wise comparisons of relative CBV maps were made between before scrambler therapy and after 10 scrambler therapy sessions over the entire brain volume. The relationship between individual participant CBV(measured in voxels), BDS and VAS score was also examined.

Results

Compared with before scrambler therapy, the measures of CBV exhibited significantly lower CBV in the mid cingulate cortex, posterior cingulated cortex and primary somatosensory cortex.

Conclusion

We observed decreased in the cerebral pain network of patients with burn injury. Scrambler therapy is a non-invasive, non-medicinal modality that significantly reduced burn-associated neuropathic pain. Scrambler therapy should be considered as a treatment option for burn survivors with severe neuropathic pain.

Acknowledgment

This research was supported by National Research Foundation of Korea(NRF), funded by the Ministry of Education(NRF- 2018R1C1B6008584), and Hallym University Research Fund (HURF-2017-65).