

Clinical and Diffusion Tensor imaging analyses of electroacupuncture for migraine

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Objectives: Migraine is one of the most common diseases. Medication therapy is the first choice for primary headache, but some patients show resistance for medical therapy. Recently, neuromodulation such as peripheral nerve field stimulation (PNfS) is used for the treatment of migraine and neuralgia. However, PNfS requires implantation surgery, so some complications such as infection and hardware erosion were reported. In addition, the mechanism of PNfS has not yet been fully understood. In this study, we investigated whether electro-acupuncture could reproduce the effects of Cervical 2 area PNfS (EAP-C2-PNfS).

Methods: A board accredited headache physician diagnosed the headache using the International Classification. The 36 patients were diagnosed as migraine without aura (MWoA) and they underwent 3.0T MRI including Diffusion Tensor Imaging (DTI) before and after EAP-C2-PNfS. We assessed headache intensity using Numerical rating scale (NRS), impact of headache on daily disability using Short-form 36 (SF-36) and Headache Impact Test (HIT-6), and self-rating depression scale (SDS) as the depression assessment tool. Each scale was evaluated before and after EAP-C2-PNfS.

The acupuncture needles were subcutaneously inserted into the bilateral occipital scalp about 15 to 20mm and biphasic electrical pulse waves were applied for 15 minutes using electrical

stimulator. The EAP-C2-PNfS was performed once per a week for 3 months.

For imaging analysis, we used tract-based spatial statistics and analyzed Fractional anisotropy (FA) in whole brain.

Results: All clinical indexes significantly improved after 3 months of EAP-C2-PNfS. FA decreased at many brain regions. All subjects showed no adverse event with EAP-C2-PNfS.

Discussion and Conclusion: Recently some reports suggest that dysfunction and central sensitization are present in pathology of chronic headache. In this study, clinical indexes of headache and depression were significantly improved and right hemisphere FA decreased after EAP-C2-PNfS. This study indicated that EAP-C2-PNfS is effective by neuromodulation for MWoA.