



Functional MRI and Acupuncture in Recovery After Stroke

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Background:

Stroke is the second leading cause of death in China and many parts of the world. Many millions of patients remain disabled after stroke despite rehabilitation. Despite a lack of compelling evidence, acupuncture has been tried by many stroke patients to promote functional recovery. Functional MRI is sensitive to minute changes in regional blood oxygenation due to activation of specific brain regions during physiological tasks.

Methods:

In collaboration with the Jockey Club MRI Engineering Centre, brain activations were mapped by functional MRI upon physiological tasks with or without stimulation of deficit-related acupoints in healthy volunteers, stroke patients with persistent neurologic deficits, and age-matched healthy control subjects. We tested several acupoints related to motor, language, visual, or sensory dysfunctions. Standard parametric mapping 99 was used in generating the functional MRI data.

Results:

Among healthy volunteers and age-matched controls, our results were similar to those obtained by other research groups. Briefly, stimulation of certain acupoints per se can activate specific brain regions similar in pattern when compared to physiological tasks. Among stroke patients with persistent neurologic deficits, significant brain activations were seen during electrical stimulation of acupoints implicated in motor, language or sensory but not visual dysfunctions. In general, activations were seen in the peri-lesional and homologous sites of stroke patients.

Conclusions:

Cortical functional reorganization is an important mechanism in functional recovery after stroke. Benefit of acupuncture in stroke patients may be derived from its ability in modulating the activities of the cerebral cortex. Functional MRI may be useful in identifying responders to a course of acupuncture over specific acupoints. Further clinical trials are warranted.