Changes in Regional Cerebral Blood Flow and Glucose Metabolism Following Electroacupuncture at LI 4 and LI 11 in Normal Volunteers

Abstract

Objectives: Although numerous trials have demonstrated the clinical effects of acupuncture, the mechanism of its therapeutic effect still remains uncertain. Recent neuroimaging studies using functional magnetic resonance imaging, single-photon emission computed tomography (SPECT), and positron emission tomography (PET) have revealed that acupuncture therapy may alter brain activity. This study was performed to evaluate changes in regional cerebral blood flow and glucose metabolism following electroacupuncture (EA) in normal volunteers.

Design and setting: Twenty (20) normal volunteers were enrolled for brain SPECT and 13 normal volunteers were enrolled for 18F-fluorodeoxyglucose PET. A few days after the baseline measurements, EA was performed at two acupoints (LI 4 and LI 11) for 15 minutes and a second brain image was acquired for each subject. We used statistical parametric mapping 2 to analyze the changes in brain perfusion and glucose metabolism.

Results: Significant increases in perfusion were observed in the left middle frontal gyrus, the superior parietal gyrus, the right superior frontal gyrus, and the middle parietal gyrus. Following EA, glucose metabolism significantly increased in the left superior medial frontal gyrus, the middle frontal gyrus, and the right superior medial frontal gyrus (paired t-test, uncorrected $p < 0.005$).

Conclusions: There were specific increases in both regional cerebral blood flow and glucose metabolism following EA in both frontal regions. This common brain response in localized regions was induced from stimulation of specific acupoints (LI 4 and LI 11).