

**Conclusion:** This study suggests Gunchilgyebok-Wan may have effects of anti-tumor and immunopotentiating activity without any related adverse effects.

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### Short-term Effect of Acupuncture on Functional Brain Connectivity of Bell's Palsy



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**Purpose:** Bell's palsy (BP), a peripheral idiopathic disease affecting facial nerve (CN VII), has been cured with acupuncture for long time. This study investigates acupuncture short-term effects on sensorimotor network (SMN) and default-mode network (DMN) during resting states for BP patients.

**Methods:** Two resting state functional MRI (pre- and post-acupuncture) were performed over 35 healthy and 58 BP patients (Some participated multiple times). Patients' scans were assigned to three different groups based on disease duration (D) and House-Brackmann score (HBS) as early (HB>I, D<14days), late (HB>I, D>14days), recovered (HB=I, D>14days) groups. Patients were treated using acupuncture (three times/week). Dual regression-ICA approach for brain functional connectivity analysis was performed. All individual maps of right-sided BP patients were flipped around y-axis.

**Results:** In early group, SMN connectivity to bilateral SI, MI and SII; ipsilateral (left) insula; and contralateral (right) cuneus and lingual gyrus were decreased in post-acup, while it was increased with contralateral SI, MI, Insula and SII in late group. For DMN, early group had increased connectivity in bilateral dorsolateral prefrontal cortex, cerebellum, and anterior cingulate cortex; ipsilateral insula and ventro-lateral prefrontal cortex; and contralateral DMN area (dorso-medial pre frontal cortex, angular gyrus and para-hippocampus) in post-acup. Recovered group had increased connectivity in motor area (bilateral cerebellum, ipsilateral MI, premotor) and facial processing area (superior temporal gyrus).

**Conclusion:** Acupuncture decreased SMN connectivity to bilateral sensori-motor regions in early stage and increased it to contralateral side in late stage to compensate the brain connectivity changes that we found in other study of BP. Also, DMN connectivity was increased with DMN area itself, motor, emotional and cognitive areas maybe to improve motor function. In addition, DMN connectivity to motor and facial processing areas was increased in recovered stage because there is still negative neuroplasticity effect to be treated by acupuncture.

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### Acupuncture induces long-term changes for Sensorimotor Network of Bell's palsy in resting state



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**Purpose:** Bell's palsy (BP) is a peripheral idiopathic disease affecting facial nerve (CN VII), and is treated with acupuncture for long time. Acupuncture underlying mechanism and efficacy are still unknown. This study investigates acupuncture long-term effect on sensorimotor network (SMN) during resting state of BP patients.

**Methods:** 10 Minutes resting state fMRI (TR=3sec) was performed after acupuncture session for 35 healthy participants and 58 BP patients (Some participated multiple times). Patients' scans were assigned to three different groups based on their disease duration (D) and House-Brackmann score (HBS) at scan day as early (HB>I, D<14), late (HB>I, D>14), recovered (HB=I, D>14) groups. Patients were treated using acupuncture (three times/week). Dual regression-ICA approach for brain functional connectivity analysis was performed and all individual maps of right side BP patients were flipped around y-axis.

**Results:** For SMN, early group had increased connectivity over healthy group in contralateral to paretic side (right) pre-cuneus, superior occipital cortex (SOC), angular gyrus, and superior temporal gyrus (STG); and decrease in ipsilateral (left) middle temporal gyrus (MTG), dorsolateral prefrontal cortex (DLPFC), and STG. Late group had an increase in contralateral DLPFC, middle cingulate cortex (MCC); and ipsilateral primary sensory cortex (SI), primary motor cortex (MI); and decrease in contralateral DLPFC. While recovered group had increased in contralateral angular gyrus and STG and ipsilateral MI; and decrease in contralateral MI and SI, and ipsilateral premotor.

**Conclusion:** There was long-term response to acupuncture SMN brain connectivity changes over different stages of BP. SMN connectivity to contralateral side was increased with sensory, motor and cognitive regions in late group while in recovered stage; SMN connectivity was decreased to these regions. These changes might be to compensate the changes due to BP according to our other study.

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