

Amplitude of Low-Frequency Fluctuation

Consciousness disorders (DoC) from severe brain injuries have significant impacts. However, further research on nuanced biomarkers is needed to fully understand the condition. A study employed **Resting-state functional magnetic resonance imaging** (rs-fMRI) and the amplitude of low-frequency fluctuation (ALFF) to investigate differential **brain activity** in patients with **Spinal cord stimulation for Consciousness disorder**. It also assessed the predictive value of rs-fMRI and ALFF in determining the consciousness levels at 3 months post-therapy.

They analyzed rs-fMRI data from 31 patients with traumatic brain injury (TBI) and 22 with non-traumatic brain injury (non-TBI) diagnosed with DoC. ALFF was measured before SCS therapy, and clinical outcomes were assessed 3 months later using the Coma Recovery Scale-Revised.

Results: Patients with TBI showed increased ALFF in the thalamus and anterior cingulate cortex, whereas the middle occipital lobe showed decreased ALFF. In the non-TBI group, a higher ALFF was noted in the precuneus, with a reduced ALFF in the occipital and temporal lobes. Patients with improved consciousness post-SCS exhibited distinct ALFF patterns compared with those with unchanged consciousness, particularly in the posterior cingulate and occipital regions.

Conclusion: The application of ALFF in rs-fMRI may be a predictive tool for post-treatment outcomes in patients with DoC of varying etiologies. Differential ALFF in specific brain regions could indicate the likelihood of improvement in consciousness following SCS therapy.

Clinical trial registration: <https://www.chictr.org.cn/>, Identifier ChiCTR2300069756 ¹⁾.

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Qin X, Chen X, Yao L, Lu F, Liang Z, He J, Guo X, Li X. Differential brain activity in patients with disorders of consciousness: a 3-month rs-fMRI study using amplitude of low-frequency fluctuation. *Front Neurol*. 2024 Dec 13;15:1477596. doi: 10.3389/fneur.2024.1477596. PMID: 39734630; PMCID: PMC11673223.

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