Resting-State fMRI Investigation in Patients with Cervical Spondylotic Myelopathy

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Abstract Cervical spondylotic myelopathy (CSM) is a common degenerative neurological disorder, usually influence on the walking ability with balance problem. The balance control during walking is a problem of motor and sensory function deficits, as well as cognitive impairs. Brian resting-state fMRI is a promising tool to investigate the cognitive-behavioral function in patients with CSM. In this study, a total of 20 CSM patients (age = 62 ± 14 years, male/female = 15/5, duration of symptom > 1 year, compression position range from C3 to C6 segment) were recruited to compare with a group of 30 healthy controls (age = 36 ± 12 years, male/female = 18/12). Most CSM patients presented walking disability if balance. Graph theory analysis of resting-state fMRI brain was performed to calculate the level of global intensity and local intensity. Results revealed that global intensity did not show significant difference between CSM patients and healthy controls. CSM patients with walking balance problem have significantly higher cerebellum local intensity than healthy controls. Furthermore, the cerebellum local intensity firstly increased, then decreased, and finally maintained at a certain level as the symptom of walking disturbance getting worse, indicating the finite ability of cerebellum functional plasticity. Findings of this study could enrich our understanding on the treatment and rehabilitation training of CSM patients with walking disturbance.

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