

ABSTRACT

Objective: To investigate the cerebellar inhibitory influence on the primary motor cortex in patients with focal dystonia using a cerebellar continuous theta-burst stimulation protocol (cTBS) and to evaluate any relationship with movement abnormalities.

Methods: Thirteen patients with focal hand dystonia, 13 patients with cervical dystonia and 13 healthy subjects underwent two sessions: (i) cTBS over the cerebellar hemisphere (real cTBS) and (ii) cTBS over the neck muscles (sham cTBS). The effects of cerebellar cTBS were quantified as excitability changes in the contralateral primary motor cortex, as well as possible changes in arm and neck movements in patients.

Results: Real cerebellar cTBS reduced excitability in the contralateral primary motor cortex in healthy subjects and in patients with cervical dystonia, though not in patients with focal hand dystonia. There was no correlation between changes in primary motor cortex excitability and arm and neck movement kinematics in patients. There were no changes in clinical scores or in kinematic measures, after either real or sham cerebellar cTBS in patients.

Conclusions: The reduced cerebellar inhibitory modulation of primary motor cortex excitability in focal dystonia may be related to the body areas affected by dystonia as opposed to being a widespread pathophysiological abnormality.

Significance: The present study yields information on the differential role played by the cerebellum in the pathophysiology of different focal dystonias.