CONTRALATERAL AND IPSILATERAL INTRACORTICAL INHIBITION IN CERVICAL DYSTONIA

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Funding provided by the Department of Rehabilitation Medicine, Divisions of Physical Therapy and Rehabilitation Science. Funding also provided by the University of Minnesota Doctoral Dissertation Fellowship.

This study was approved by the University of Minnesota Institutional Review Board and Clinical Translational Science Institute and conformed to the ethical standards of the institutional research committee and with the Declaration of Helsinki. Written informed consent was obtained from all participants.

Background and Purpose: Cervical dystonia (CD) is a movement disorder characterized by involuntary neck muscle contractions. Few treatments are available because the pathology is unknown. Impaired intracortical inhibition has been reported in patients with CD when measured via contralateral corticofugal pathways; however, ipsilateral pathways have not been assessed. The purpose of this study is to evaluate contralateral and ipsilateral mediated measures of intracortical inhibition in people with cervical dystonia and healthy controls.

Subjects: 15 participants (10 CD, 5 aged matched controls); planned enrollment N=40.

Methods: Testing was completed using transcranial magnetic stimulation delivered to the primary motor cortex. Cortical silent period (cSP), a measure of GABAergic inhibition, was collected. Electromyographic recordings were collected bilaterally in the upper trapezius as participants performed an isometric shoulder shrug. Stimulation intensities included 100%, 110%, 120%, 130%, and 140% of the cSP threshold to assess input-output characteristics of motor cortex excitability.

Analyses: A multifactorial ANOVA was implemented with group, hemisphere (right/left), and stimulation intensity as factors. Post hoc analyses included two-way ANOVA and Tukey HSD.

Results: Preliminary results are reported. cSPs were collected contralaterally (all participants) and ipsilaterally (4 CTL and 8 CD participants). The ANOVA showed a significant interaction of hemisphere*Group \( F(1, 268) = 5.4256, p = 0.0207 \) and Group*Side \( F(1, 268) = 6.0652, p = 0.0145 \). Two-way ANOVA post-hoc revealed a significant group difference in the left hemisphere*ipsilateral evoked CSPs \( F(9, 59) = 4.0462, p = 0.0006 \). Tukey HSD paired post-hoc analyses did not reveal any differences between groups at any individual stimulation intensity.

Conclusions: Results suggests that people with CD have impaired inhibition in ipsilateral pathways compared to the controls.

Implications: Widespread loss of inhibition suggests an overarching maladaptive state of the motor system. Treatment strategies utilizing coordinated movements, requiring both unilateral and bilateral demand may be useful to improve voluntary control in people with CD.