**INTRODUCTION**

A common symptom of Multiple Sclerosis (MS) is weakness on one side of the body, particularly the lower limbs. The subsequent strength asymmetries have been suggested to be a significant cause for the progressive decrease in the ability to perform tasks of daily living in people with MS (PwMS).

Transcranial direct current stimulation (tDCS) is a non-invasive brain stimulation technique that has been shown to enhance motor function in healthy adults and other neurological disorders. However, to date the effects of tDCS on motor function in PwMS remain largely uninvestigated.

**PURPOSE**

1) Compare leg strength between sides of the body in PwMS
2) Identify the associations between the knee extensor strength of the more affected leg and subjective and objective functional mobility measures
3) Determine whether tDCS can increase fatigue resistance of the more-affected leg

**METHODS**

**Strength Testing**

Maximal voluntary contractions (MVCs) of the knee extensors

More and less-affected side were based on strength differences but referred to self-report when within 10%.

**Questionnaires:**

- Falls Efficacy Scale International (FES-I) | Fatigue Severity Scale (FSS)
- Functional mobility tasks:
  - Timed-up-and-go | 25 foot walk test | Sit-to-stand

**Preliminary testing:**

**Fatigue task:**

Sustained isometric contraction at 15% of knee extensor MVC of the more affected leg for as long as possible during either tDCS or SHAM (randomized)

**tDCS:** stimulation at 2mA over the motor cortex contralateral to the more-affected leg

**SHAM:** stimulation until maximum current of 2mA was reached but then terminated

**Participant Characteristics**

N 34 (8 men)

- Disease Duration 13.7 (8.6)
- BMI 25.5 (4.9)
- PDSS 2 (0-6)
- MVPA/day (min) 29.1 (20.8)

**Statistical analysis:**

Paired Student’s T-test between more-affected and less-affected strength.

Pearson correlations between strength of the more affected leg and questionnaires/mobility tasks.

**RESULTS**

Greater strength in the more affected leg was associated with better scores on subjective measures influencing mobility

Greater strength in the more affected leg was associated with better scores on objective measures influencing mobility

**SUMMARY & FUTURE DIRECTIONS**

Preliminary data: Time to task failure of the more affected leg increases during a sustained isometric fatigue task with tDCS

Lower strength in the more-affected leg was associated with greater perception of fatigue and an increased risk for falls.

Lower strength in the more affected leg was also positively correlated to functional mobility tasks.

Identify whether increasing fatigue resistance of the more-affected leg via tDCS could improve mobility in PwMS.

**REFERENCES**


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