Impact of expiratory muscle strength training (EMST) on phonatory performance in Parkinson's patients

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Session Information

Date: Monday, June 20, 2016

Session Title: Parkinson's disease: Non-motor symptoms

Session Time: 12:30pm-2:00pm

Location: Exhibit Hall located in Hall B, Level 2

Objective: The current study adopted a randomized control trial (RCT) design to investigate the impact of expiratory muscle strength training (EMST) on vocal loudness and sustained phonation performance in patients with Parkinson's disease (PD).

Background: With muscle rigidity and hypokinesia associated with the respiratory system, PD patients exhibit upper airway obstruction (UAO) that hinders normal breathing. Speaking with clear voice can be greatly affected and the problems worsen as the disease progresses. About 80% of individuals with PD were diagnosed with hypokinetic dysarthria featured with reduced vocal loudness and monotonous speech which could significantly diminish patients' ability in effective communication. Expiratory muscle strength training (EMST) has been available to improve expiratory driving force for both ventilatory and non-ventilatory actions. Previous studies showed its effects in improving voluntary cough in PD as well as increased maximum phonation time (MPT) for individuals with dysarthria. Seeing the improvement in volitional cough in PD patients, the potential use of EMST in facilitating PD speech and voice was then furthered explored in the present study.

Methods: Maximum expiratory pressure (MEP), sound pressure level (SPL), and MPT were obtained from 40 individuals with PD before and after EMST program. PD participants were randomly assigned into EMST group and sham group. Those in the EMST group were provided a small device, EMST150, for training administered by an experienced speech therapist, while participants in sham group were provided a spirometer without any loading (placebo). During the training, participants were instructed to blow through the EMST device (loading set at 75% of MEP) as hard and fast as possible after a maximum inhalation, followed by a rest for 15-30 seconds before the next blowing resumed. The training protocol was: 5 blowing repetitions per set, 5 sets a day for 20 days in a 4-week period.

Results: MEP, SPL and MPT were significantly increased for EMST group while no significant changes were seen in Sham group. The data indicate that EMST training can effectively improve phonatory performance in PD patients with compromised respiratory output.

Conclusions: Vocal loudness and sustained phonation improved for EMST program but not blowing exercise. Individuals with PD can speak with louder voice after an expiratory muscle strength training program.

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