

Abstract

Title: Changes in chest wall intermuscular coherence and speech breathing kinematics during speech and non-speech tasks following LSVT LOUD® in children with dysarthria secondary to cerebral palsy.

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Purpose: The present study examined the effects of LSVT LOUD on respiratory control via lung volume events and chest wall intermuscular coherence for non-speech and speech tasks in children with CP and motor speech disorders. This physiological investigation evaluated both short- and long-term treatment responses specific to speech motor control efficiency. **Method:** Sixteen children with CP and motor speech disorders received LSVT LOUD. A matched group of typically developing (TD) children served as controls. Assessments were conducted pre-, post-treatment, and after a twelve-week maintenance program. The TD children were assessed at equivalent time-points. Respiratory inductance plethysmography measured speech breathing kinematics and surface electromyography (sEMG) measured activity from the intercostal and oblique muscles. Children performed both non-speech and speech tasks. Kinematics assessed lung volume events and sEMG signals were used to derive measures of intermuscular coherence. **Results:** No changes in kinematics or coherence were observed in the TD children across any of the time-points. Children with CP showed higher lung volume initiations and increased peak intermuscular coherence immediately after treatment and maintenance. **Conclusion:** By targeting healthy vocal loudness, children with CP are able to make biomechanically efficient respiratory adjustments and increase cortical modulation of speech breathing muscles of the chest wall.