



EFFECTS OF LSVT® ON VOICE AND RESPIRATION IN INDIVIDUALS WITH MS

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Introduction

Multiple Sclerosis (MS) is a progressive disorder of the central nervous system resulting in demyelination of nerve fibers and axonal injury (Bjartmar & Trapp, 2001). It affects the white matter of the central nervous system and is characterized by progressive neurological deficits with a remitting/relapsing disease course (Sliwa & Cohen, 1998). The development of scattered lesions and/or plaques within the brain produces varying combinations of motor, sensory, and cognitive-communication impairment.

Communication Disorders in MS

A variety of communication disorders have been identified in individuals with MS, including dysarthria, aphasia, and cognitive impairment affecting communication (Achiron et al., 1992; Kujala, Portin, & Ruutinen, 1996; Lethlean & Murdoch, 1993; Olmas-Lau, Ginsberg, & Geller, 1977; Wallace & Holmes, 1993). Self-report questionnaires concerning communication difficulties associated with MS indicate that:

- 45% of respondents reported changes in speech and/or communication, and;
- 33% of MS patients reported impairments of voice, chewing and swallowing capabilities (Beukelman, Kraft, & Freal, 1985; Hartelius & Svensson, 1994).
- Despite these overwhelming figures, only a small number of MS patients (2%) are appropriately referred for treatment of speech, language, voice & swallowing disorders (Hartelius & Svensson, 1994).

LSVT®

The Lee Silverman Voice Treatment, commonly referred to as LSVT® is the first and only documented efficacious speech treatment that restores oral communication. With over 5 million dollars of NIH funding, LSVT® was initially developed for the treatment of voice in individuals with idiopathic Parkinson Disease (IPD).

Over the last decade, further support for the efficacy of LSVT® on voice for various neurologically based speech disorders, including Multiple Sclerosis (MS) has emerged.

The five concepts of LSVT® are vocal focus, high effort, intensive treatment, calibration and quantification. Centered on a very specific therapeutic target, LSVT® acts as a “trigger” to increase effort and coordination across the speech production subsystems (respiratory, phonatory, and articulatory). This “trigger” provides a comprehensive motor organizing theme that impacts multiple levels of the motor output processes in patients while limiting cognitive load.

Purpose

To determine if LSVT®, a speech production treatment originally developed for IPD patients, would have positive therapeutic effects on voice and respiration in individuals with relapsing remitting MS.

Patient Population: Demographics

Total number of participants: 5

Disease Type: Relapsing Remitting

Mean Age: 52 years old (women) ; 45 years old (men)

Gender: 3 Females; 2 Males

Mean length of time of disorder: 14 .2 years

Mean Educational Level: College Degree (16 years of education)

Location: New York Metropolitan Area

Methods

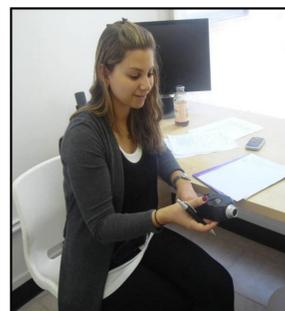
Five individuals with relapsing-remitting MS, (3 women and 2 men) with a history of MS ranging from 13-18 years participated in the study. During their initial speech evaluations, all 5 participants complained of the following symptoms associated with MS: vocal weakness, shortness of breath, and fatigue when communicating. These voice and respiratory symptoms were chronically present despite not experiencing a MS flair 3 months prior to their participation.

All five participants received 16 one hour LSVT® sessions over a 4 week period of time. The four keystone therapeutic exercises apart of LSVT® are:

1. Sustained /ah/
2. Hi/Lows
3. Functional Phrases
4. Speech Hierarchy

Exercises 1-3 comprise of the first 30+ minutes of every LSVT® session. At the end of 16 treatment sessions and successful calibration, patients are able to self-generate treatment strategies resulting in dramatically improved functional communication.

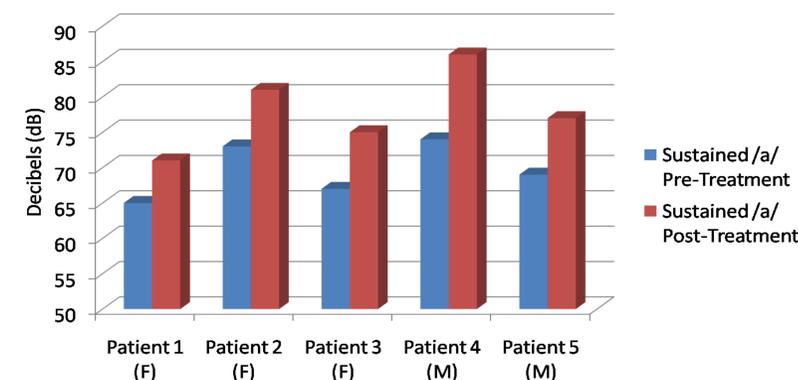
A RadioShack digital-display sound-level meter (model: 33-2055) was positioned 12 inches away from the participants mouth in order to measure /collect speech intensity during all LSVT® treatment sessions. A Spiropet Spirometer was used to capture forced vital lung capacity during the initial evaluation and as well as upon completion of the treatment.



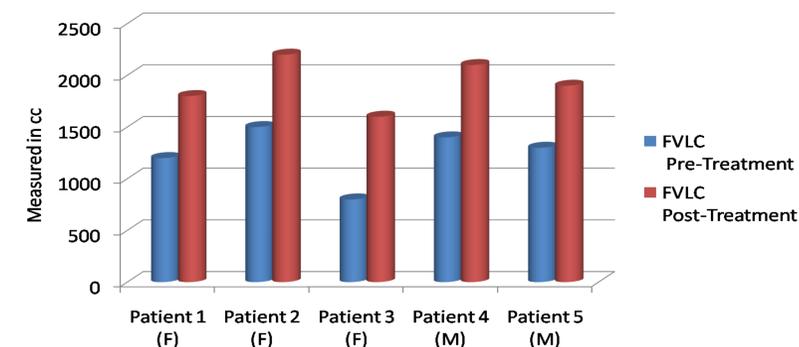
Results

- Improvement from pre- to post treatment was observed in sound pressure level (SPL) for both speech tasks (conversation) and in duration of sustained vowel phonation (/a/).
- Individuals with MS treated with LSVT® increased voice SPL from baseline to post-treatment by an average of 8 dB SPL.
- Not only were these observed changes statistically significant, but also perceptibly audible to novel communication partners.
- Significant improvement ($\bar{x} = 680$ cc) was also observed in forced vital lung capacity from pre- to post treatment in all participants.

Sustained /a/



Forced Vital Lung Capacity



Conclusion & Discussion

- 4 out of 5 patients reported to “feel more confident when communicating” upon completion of LSVT® treatment.
- Implementation of LSVT® will likely empower individuals with MS by enabling them to maintain or regain function in their workplace and/or home environment, which enhances self-confidence and overall quality of life.
- These findings provide further support for the efficacy of LSVT® in populations beyond IPD and for the treatment of various neurologically based speech disorders such as Multiple Sclerosis.

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