Does Lee Silverman Voice Treatment (LSVT) have a long-term effect on speech intensity in individuals with Parkinson's disease?

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This critical review examined literature on the long-term effects of the Lee Silverman Voice Treatment (LSVT) program on speech intensity among individuals with idiopathic Parkinson's disease (PD). Four longitudinal randomized control trials and one longitudinal study were included in this review. Overall, these studies provided suggestive evidence to support the use of LSVT for the long-term maintenance of increased speech intensity among individuals with PD. Recommendations for clinical practice and future research are discussed.

Parkinson's disease (PD) is a progressive neurological disease that results from damage to the basal ganglia, a subcortical structure in the brain (Duffy, 2005). The loss of nerve cells and decreased levels of dopamine within the basal ganglia result in the presentation of the key motor and speech symptoms (Duffy, 2005). Speech and voice problems are experienced by approximately 75% of individuals with PD (Logemann, Fisher, Boshes, & Blonsky, 1978). One of the most common speech characteristics associated with Parkinson's disease is "hypophonia" or reduced speech intensity (Adams & Dykstra, 2009). Fox and Ramig (1997) attribute this deficit in speech intensity to a calibration error or an inconsistency between the actual intensity of speech production and the perceived amount of effort involved in speech production. Reduced speech intensity can be debilitating for individuals with PD,

databases were used. The following key words were used for the database search: [(LSVT) OR (Lee Silverman Voice Treatment) AND (speech intensity) OR (speech loudness) AND (long-term) OR (follow-up) AND (Parkinson's disease) OR (Parkinson's)]. In addition, the reference lists of key articles were manually searched for pertinent articles that met the inclusion criteria for this critical review.

Selection Criteria

The studies selected for inclusion in this critical review were required to investigate the long-term effectiveness (i.e., beyond post-treatment data collection) of the LSVT program among individuals with idiopathic PD using either objective measures of speech intensity or subjective measures of speech loudness. There were no limitations placed on the age of the participants, time since diagnosis, stage of Parkinson's disease, severity of the speech and/or voice problems, and the length of follow-up.

Data Collection

The literature search yielded 5 articles that met the selection criteria, including 4 longitudinal randomized control trials and 1 longitudinal study. Four of the studies assessed objective measures of speech intensity and one of the studies examined subjective measures of speech loudness. Long-term measures ranged from 6 months to 2 years post-treatment.

The level of evidence was rated for each study using the levels of evidence scale that was adapted from the Oxford Centre for Evidence-based Medicine (OCEBM, 2009).

Longitudinal Randomized Control Trials

A respiratory treatment program (RET) was used as the control group for 3 of the RCTs. RET entails increasing respiratory effort in order to increase loudness (Sapir et al., 2002).

Ramig et al. (1996) examined the long-term effects of LSVT (n=22) versus RET (n=13) on speech intensity among individuals with idiopathic PD up to 12 months follow-up. Acceptable MANOVAs revealed that only the LSVT group showed a significant increase and maintenance of this increased speech intensity at 6 months and 12 months follow-up for sustained vowel phonation and reading "The Rainbow Passage" but not for the conversational monologue task.

This level 1 study

from pre-treatment to 6 months follow-up across all speech tasks (sustained vowel phonation, reading "The Rainbow Passage," describing the "Cookie Theft Picture," and conversational monologue).

This level 1 study demonstrated a strong research design with 3 treatment groups of similar size. The researchers included both a PD control group and a neurologically normal control group in an effort to rule out extraneous variables (Ramig et al., 2001b). A picture description speech task, which represents more naturalistic speech, was used in addition to the LSVT

This raises major concerns over potential biases in these RCT studies despite the fact that using RET as a control is more rigorous than using no treatment (Ramig et al., 2001b). In addition, most of the speech intensity measures are part of the LSVT treatment protocol; therefore, differences between the LSVT and control group at follow-up may have been confounded by practice effects.

There are also some general concerns related to the methodology of the studies reviewed. There are inconsistencies in the inclusion of otolaryngological assessment, and the assessment of hearing and cognitive status. This is relevant because hearing loss, cognitive impairments, and speech/voice problems that are unrelated to PD could interfere with the efficacy of treatment and performance during data collection. Also, participants were not grouped based on stage of disease or speech and voice severity, which is important to note because the effectiveness of LSVT on speech intensity may vary depending on the stage and severity. However, using a diverse group of participants with idiopathic PD allows for the results from these long-term speech intensity studies to be generalizable to a broader range of individuals with idiopathic PD. Further methodological issues include the failure to use blinding of clinicians and listeners across all studies, and the absence of test-retest reliability measures for the participants and inter- and intra-rater agreement measures for the clinicians and listeners.

While the results from these LSVT studies are promising, the participants are producing “lab speech” or speech that is created in the artificial context of the lab environment. Therefore, it is difficult to determine how generalizable these speech intensity results are to normal conversation and real-life speaking environments.

An interesting trend that arose in this critical review is that the LSVT PD participants demonstrated a slight decline in speech intensity from post-treatment to follow-up. In addition, there are inconsistencies across studies in the conversational measures of speech intensity. Ramig et al. (2001a & b) found maintenance of increased speech intensity for conversation at follow-up, while other studies failed to find evidence for improvements in speech intensity for conversation at follow-up (Ramig et al., 1996;

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