



Combining voice therapy and physical therapy: A novel approach to treating muscle tension dysphonia



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ARTICLE INFO

Article history:

Received 19 November 2014

Received in revised form 23 February 2015

Accepted 8 May 2015

Available online 19 May 2015

ABSTRACT

Objective: This study investigated the role of a specialized physical therapy program for muscle tension dysphonia patients as an adjunct to standard of care voice therapy.

Study Design: Retrospective Cohort Study Methods Adult MTD patients seen between 2007 and 2012 were identified from the clinical database. They were prescribed voice therapy and, if concomitant neck pain, adjunctive physical therapy. In a pragmatic observational cohort design, patients underwent one of four potential treatment approaches: voice therapy alone (VT), voice therapy and physical therapy (VT + PT), physical therapy alone (PT), or incomplete/no treatment. Voice handicap outcomes were compared between treatment approaches.

Results: Of 153 patients meeting criteria (Median age 48 years, 68% female, and 30% had fibromyalgia, chronic pain, chronic fatigue, depression, and/or anxiety), there was a similar distribution of patients with moderate or severe pre-treatment VHI scores across treatment groups (VT 45.5%, VT + PT 43.8%, PT 50%, no treatment 59.1%; $p = 0.45$). Patients treated with VT alone had significantly greater median improvement in VHI than those not treated: 10-point vs. 2-point ($p = 0.02$). Interestingly, median VHI improvement in patients with baseline moderate-severe VHI scores was no different between VT (10), VT + PT (8) and PT alone (10; $p = 0.99$).

Conclusions: Findings show voice therapy to be an effective approach to treating MTD. Importantly, other treatment modalities incorporating physical therapy had a similar, albeit not significant, improvement in VHI. This preliminary study suggests that physical therapy techniques may have a role in the treatment of a subset of MTD patients. Larger, comparative studies are needed to better characterize the role of physical therapy in this population.

Learning Outcomes: The reader will describe symptoms associated with muscle tension dysphonia and current treatment. The reader will describe the systematic adjunctive physical therapy approach and understand the rationale to consider incorporation of physical therapy into the current treatment regimen.

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1. Introduction

Lifetime risk of developing a voice disorder is 30% with an estimated point prevalence of 3–9% in the U.S. population (Roy, Merrill, Gray, & Smith, 2005; Verdolini & Ramig, 2001). Voice disorders negatively impact quality of life (Cohen, Dupont, & Courey, 2006), job performance, and job attendance (Cohen et al., 2006), costing approximately \$2.67 billion dollars in lost wages, physicians' visits, and treatment expenses (ASHA, 2005; Roy et al., 2005). Muscle tension dysphonia (MTD) is a functional voice disorder that comprises approximately 10–40% of clinical caseloads in voice centers (Van Houtte, Van Lierde, & Claeys, 2001). It is characterized by increased laryngeal musculoskeletal tension with excessive muscular recruitment in the larynx and pharynx with concomitant disruption of efficient vibratory parameters (Morrison & Rammage, 1993). MTD is further classified as primary or secondary. Primary occurs in the absence of identifiable fixed laryngeal pathology (e.g. vocal fold lesions, paralysis), while secondary refers to MTD that occurs concomitantly with such pathologies. Clinically, both types present with variable symptomology including hoarseness, vocal fatigue, effortful voice production, change in habitual pitch, reduced vocal range, pain with voice use, muscular cramping and neck stiffness.

There is growing recognition that voice production requires whole-body muscular engagement. For example, posture related to the spine, shoulders, and hip position can impact voice (Gilman, 2010; Kooijman et al., 2005; Schneider, Dennehy, & Saxon, 1997). During speaking tasks, expiratory muscles and passive recoil of the thorax act to maintain adequate subglottic pressure for voicing. The sternocleidomastoid, scalene, and trapezius muscles are recruited to allow greater control of thoracic contraction during singing and complex speech tasks in which loudness and pitch are varied. This permits greater regulation of the subglottic pressures required to complete these demanding tasks (Pettersen, Bjorkoy, Torp, & Westgaard, 2005). Resonance also necessitates intricate coordination of muscles that alter tongue position, larynx height, and mouth opening (Roy, Nissen, Dromey, & Sapir, 2009). Therefore, muscle imbalances can disrupt any and all aspects of the mechanism – respiration, phonation, and articulation/resonance – and produce symptoms of MTD.

Treatment of MTD focuses on the rebalancing of subsystems involved in voice production, including respiration, phonation, and articulation, ultimately resulting in restoration of proper vibratory parameters and improved efficiency of voice production (Roy et al., 2009; Roy & Bless, 1998). A systematic review from the Cochrane Collaboration found behavioral voice therapy – a combination of direct and indirect methods – to be an effective treatment for MTD (Ruotsalainen et al., 2007). Indirect methods include vocal hygiene and voice conservation education. Direct methods use vocal exercises, facilitating vocal techniques, and often circumlaryngeal massage to increase efficiency of voice production and reduction of extra-laryngeal muscle tension. Manual circumlaryngeal massage is used to regulate and restore the balance of intrinsic and extrinsic laryngeal musculature during phonation (Roy & Bless, 1998). Some have attributed a portion of voice therapy failures to insufficient reduction of musculoskeletal tension (Aronson, 1990), thereby underscoring the importance of manual treatment in this patient population.

Current treatment for MTD addresses extrinsic laryngeal area muscle tension, despite growing recognition implicating both laryngeal and “extralaryngeal musculature” as therapeutic targets (Boone, McFarlane, Von Berg, & Zraick, 2010; Roy & Bless, 1998). To treat the entire mechanism requires collaboration with practitioners adept at treating neck, back, shoulder, and diaphragmatic/abdominal muscular tension. In this study, we introduced a manual physical therapy treatment program as an adjunct to traditional voice therapy. The aim of this study was to determine patient perceived improvement in voice handicap using the Voice Handicap Index (VHI) (Jacobson et al., 1997) when treated with (1) voice therapy alone, (2) combined voice and physical therapy, (3) physical therapy alone, or (4) incomplete or no treatment.

2. Materials and methods

This retrospective cohort study was performed in accordance with the Declaration of Helsinki, Good Clinical Practice, and was approved by the Institutional Review Board (IRB #131767).

2.1. Patient database

Patients who presented to our voice clinic had demographic information and selected clinical data collected and entered into a secure Research Electronic Database Capture System (REDCap) database (Harris et al., 2009). Patients completed survey materials at their initial clinic visit, follow-up visits, and any unique visits for voice therapy or manual physical therapy. Specific components included patient characteristics (e.g. age, gender), type of voice disorder (e.g. MTD, nodules), and treatments (e.g. voice therapy, physical therapy, and number/dates of visits) and Voice Handicap Index (VHI) scores (Jacobson et al., 1997).

2.2. Inclusion criteria

For study inclusion, patients must have (1) been diagnosed with MTD by the treating laryngologist between 2007 and 2012; (2) had no laryngeal lesions (e.g. polyps, nodules, cancer) or neurological voice disorders (e.g. spasmodic dysphonia, tremor, vocal fold paresis/paralysis); (3) were ≥ 18 years of age; and (4) had ≥ 2 completed VHI scores with an initial VHI greater than 10; and (5) had no treatment lapses > 90 days. A cut-off of 10 on the VHI was considered a conservative “normal” voice score based on a normative study that reported a mean VHI of 6.86 (SD 9.88) (Arffa, Krishna, Gartner-Schmidt, & Rosen,

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