Original article

Thoracic spinal manipulation for musculoskeletal shoulder pain: Can an instructional set change patient expectation and outcome?

Sean P. Riley [a, b, *], Joel Bialosky [c], Mark P. Cote [a], Brian T. Swanson [d], Vincent Tafuto [a, b], Phillip S. Sizer [e], Jean-Michel Brismée [e]

[a] UCONN Health, Farmington, CT, USA
[b] University of Connecticut, Physical Therapy Program, Storrs, CT, USA
[c] University of Florida, Department of Physical Therapy, Gainesville, FL, USA
[d] Texas Woman's University, Houston, TX, USA
[e] Center for Rehabilitation Research, School of Allied Health Sciences, Texas Tech University Health Sciences Center, Lubbock, TX, USA

ABSTRACT

Study design: Planned secondary analysis of a randomized clinical trial.
Objectives: To examine: 1) patients' baseline expectations for treatment outcome of thoracic high velocity low amplitude thrust manipulations (HVLATM) to the thoracic spine for shoulder pain; 2) if the message conveyed by the clinician changed the patients' expectation; 3) any differences in outcome based on expectation independent of messaging.; and 4) any differences in outcome for those patients whose expectations significantly changed as a result of the messaging.
Background: Thoracic HVLATM may be an effective intervention for patients suffering from musculoskeletal shoulder pain. The role of expectation in the treatment effectiveness of this intervention has not been established.
Methods: Subjects' expectations regarding the effectiveness of HVLATM on shoulder pain were recorded at baseline. This was reassessed immediately following the provision of positive or neutral instructional set. The subjects then received a thoracic or scapular HVLATM. The Shoulder Pain and Disability Index (SPADI) and the numeric pain rating scale (NPRS) were used as outcomes measures.
Results: There was a 10 subject change (23%) in positive expectation that was statistically significant ($p = 0.019$) following a positive message. There was no statistically significant difference in pain and function when these subjects were compared to all other subjects.
Conclusion: Although patients' expectations of positive outcome significantly changed when providing a positive instructional set, these changes did not translate into clinically significant short term changes in shoulder pain and function.
Level of Evidence: 1b.

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1. Introduction

Shoulder pain is among the three most commonly reported musculoskeletal conditions in adults (Makela et al., 1999; Picavet and Schouten, 2003). The effects of shoulder disorders on general health can be disabling (Roe et al., 2013). A study of a population of 120,000 in Finland during a six months interval between October 2007 and March 2008 found that the resource-weighted direct costs averaged $745.86 per patient (Paloneva et al., 2013). For example, non-traumatic work-related shoulder disorders in Washington State during 2005 cost on average $27,689 per claim with a mean loss of 296 workdays (Silverstein and Adams, 2005).

Thoracic high velocity low amplitude manipulation (HVLATM) has received growing attention in the literature for the treatment of patients suffering from musculoskeletal shoulder pain (Boyles et al., 2009; Strunce et al., 2009; Mintken et al., 2010; Muth et al., 2012). Early studies suggest that thoracic manipulation is an effective adjunct in patients suffering from shoulder pain (Strunce et al., 2009; Mintken et al., 2010); however, the mechanisms behind these outcomes are not well defined.

* Corresponding author. 263 Farmington Avenue, Farmington, Connecticut 06030. Tel.: +1 860 679 3233.
E-mail address: sriley@uchc.edu (S.P. Riley).

More recent literature indicated that biomechanical factors such as the location of the manipulative intervention may not matter (de Oliveira et al., 2013; Riley et al., 2014). Lack of treatment specificity suggests that the efficacy of the treatment may be related to neurophysiological mechanisms such as changes in pain sensitivity (Coronado et al., 2012) or patient expectations (Bialosky et al., 2008, 2010).

Numerous studies have suggested that there is a link between expectation and clinical outcomes in patients suffering from musculoskeletal pain (Waylett-Rendall and Niemeyer, 2004; Myers et al., 2008). (Kalauokalani et al., 2001; Mahomed et al., 2002; Hogg-Johnson and Cole, 2003; Hill et al., 2007; Gandhi et al., 2009; Bialosky et al., 2010). O'Malley et al. showed that a patient's outcome-related expectations significantly predicted changes in shoulder function and accounted for 10% of the variance in functional improvement (O'Malley et al., 2004). Research to date has not prospectively examined whether the treating clinician can modify patient expectations for HVLATM or whether such expectations are associated with improved clinical outcomes in patients receiving thoracic spinal HVLATM for the treatment of musculoskeletal shoulder symptoms. Fig. 1.

Therefore, the objectives of this study were as follows. For **Objective 1** we sought to report patients' baseline expectations of HVLATM to the thoracic spine versus placebo for the treatment of shoulder pain. For **Objective 2** we sought to determine if a positive or neutral message conveyed by the clinician changed the patients' expectations. For **Objective 3** we tested for differences in treatment outcomes based on patient expectations independent of messaging. For **Objective 4** we aimed to examine for any differences in treatment outcomes for those patients whose expectations significantly changed as a result of the messaging.

2. Methods

We conducted a planned secondary analysis of data extracted from a randomized clinical trial that compared the efficacy of thoracic HVLATM, placebo HVLATM, positive messaging, and neutral messaging on treatment outcomes for patients' with musculoskeletal shoulder pain. The methods of this trial have been previously described (Riley et al., 2014). This study protocol was approved by the local Institutional Review Board and was registered with ClinicalTrials.gov. (Riley et al., 2014) In this study both the thoracic and placebo manipulative techniques are grouped together and called thoracic HVLATM since there were no observed clinical differences between these interventions in the original study.
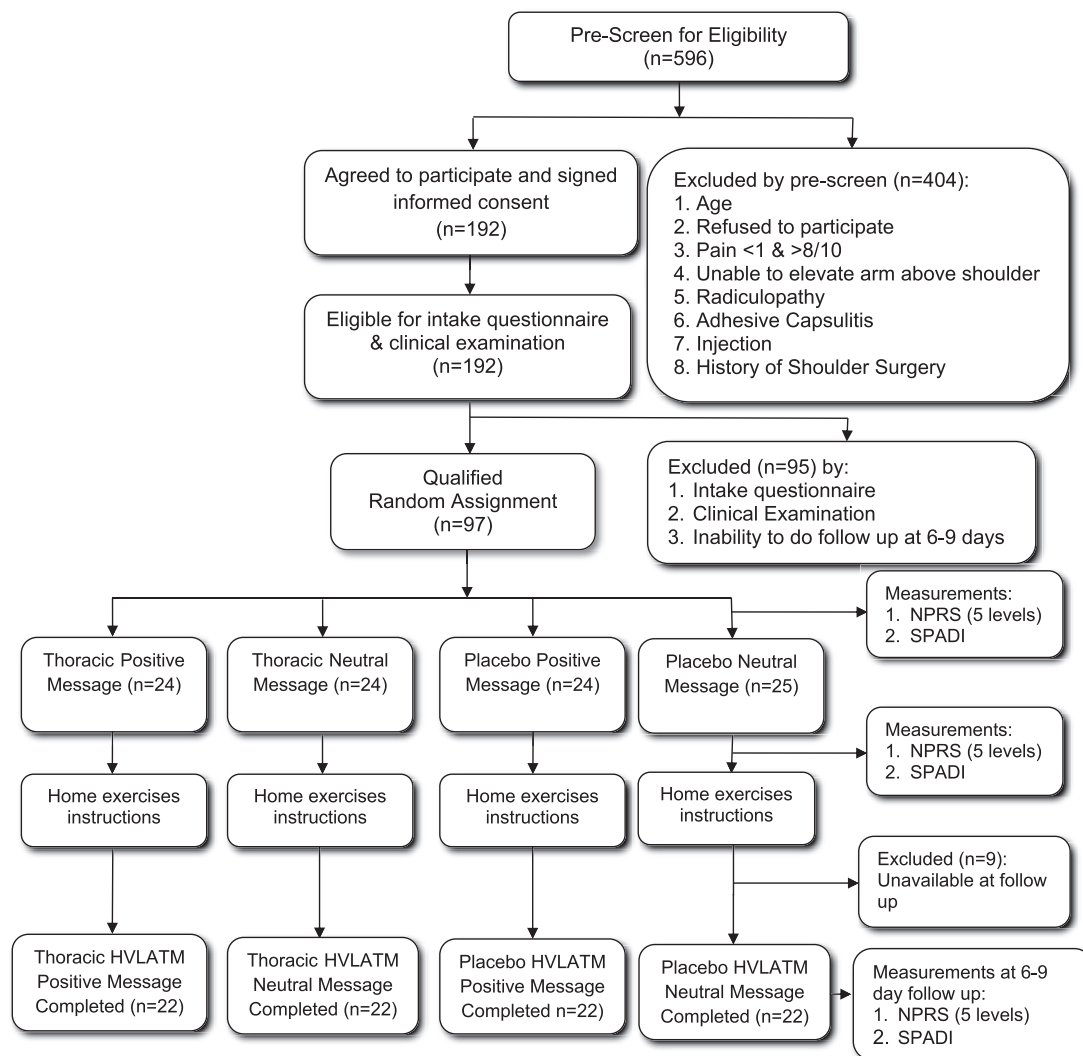

Fig. 1. CONSORT diagram of the flow of the study.