



Original article

The clinical significance of immediate symptom responses to manual therapy treatment for neck pain: Observational secondary data analysis of a randomized trial



Caelum A. Trott ^{a,1}, Maria Eliza Ruiz Aguila ^{a,b}, Andrew M. Leaver ^{a,*}

^a Faculty of Health Sciences, The University of Sydney, 75 East Street, Lidcombe, NSW 2141, Australia

^b College of Allied Medical Professions, University of the Philippines, Pedro Gil Street, Manila 1004, Philippines

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ABSTRACT

The objective was to explore aspects of symptom responses to manual therapy treatment for neck pain. An observational secondary data analysis of a randomized trial was conducted. 181 participants seeking care from a physiotherapist or chiropractor for a new episode of neck pain were included. Outcome variables included recovery-time and participant-perceived effect of treatment (GPE) at 3-months. There was a significant reduction of ≥ 1.4 points (95%CI 1.2–1.5) in pre- and post-treatment pain scores at each occasion of treatment. There was also small but significant increases in pain of ≤ 0.7 points (95%CI 0.4–1.0) between each treatment session, without regression to the preceding pre-treatment level. The relationships between immediate post-treatment effects and longer-term outcomes were explored using multivariate regression analyses. There was significant univariate association between recovery time and cumulative post-treatment changes in pain from the second, third and fourth ($\text{Exp}(B) = 1.2$) treatment sessions, as well as the presence of post-treatment headache ($\text{Exp}(B) = 0.7$) and other minor adverse symptoms ($\text{Exp}(B) = 0.6$). There was significant univariate association between GPE at 3-months and cumulative pain responses from first ($B = 0.2$), second ($B = 0.3$), third ($B = 0.3$) and fourth ($B = 0.4$) treatment sessions. The change in pain after session 1 was independently associated with GPE ($B = 0.2$). There was a consistently significant difference of ≥ 0.7 points (95%CI 0.43–0.89) in the different methods of reporting pain. Our results showed that manual therapy for neck pain involves a “two-steps forward, one-step back” recovery pattern. Whilst minor adverse events are undesirable, they do not seem to be significantly associated with long-term recovery.

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1. Introduction

Neck pain is a common musculoskeletal condition experienced by up to 15% of people at any given time, and afflicting most people at some stage of their lives (Haldeman et al., 2008; Hoy et al., 2010). Manual therapy is one of the few effective treatments for neck pain, with demonstrated benefits in improving pain and function, at least in the short term (Korthals-de Bos et al., 2003; Hurwitz et al., 2008; Driessen et al., 2012). The clinical course of neck pain appears to have fluctuating periods of aggravation and remission, with recurrence a common feature of the condition (Cote et al., 2004;

Haldeman et al., 2008; Hush et al., 2011). Based on current evidence, it would appear that manual therapy is of most value in reducing symptoms, restoring function and hastening recovery during an episode of acute neck pain.

Although acknowledged as an effective treatment, the therapeutic mechanisms underpinning manual therapy are not fully understood, and many different theoretical and philosophical approaches exist amongst and between the disciplines that practice manual therapy. One of the most widely recognized approaches to manual therapy practice is the approach developed by Australian physiotherapist Geoffrey Maitland. One of the key features of Maitland's approach was the emphasis on monitoring and reassessing symptoms during and after application of a technique, as a means guiding choice of technique, dosage and treatment progression (Maitland, 1970, 1986). This approach differed from the approaches of many of Maitland's contemporaries who tended to focus more on biomechanical principles to guide treatment decisions (Larson, 2005).

* Corresponding author. Tel.: +61 2 9351 9545; fax: +61 2 9036 7303.

E-mail addresses: Caelum.Trott@SESIHNS.health.nsw.gov (C.A. Trott), andrew.leaver@sydney.edu.au (A.M. Leaver).

¹ Current address: Prince of Wales Hospital, Barker St, Randwick, NSW 2031, Australia.

The use of patient-reported numerical ratings of current pain intensity to guide treatment selection and to monitor treatment outcomes is now widespread in modern manual therapy practice. Numerical rating scales for pain are also widely used as primary outcome measures in clinical trials of manual therapy, as a means of determining recovery from an episode of neck pain. The construct of recovery, however, is complex and multidimensional, encompassing many different elements that are not necessarily captured by a single number. Focus group interviews of people with back pain for example, have shown that people with pain scores of zero do not necessarily consider themselves recovered, and some who consider themselves recovered can still register pain scores above zero (Hush et al., 2009). Inconsistencies have been demonstrated between verbal reports of pain and the standardized questionnaires that measure pain and disability in people with low back pain (Ong et al., 2006; De Souza and Frank, 2007). Better understanding of the relationship between pain scores and patient-relevant indices of recovery, and the ability to identify possible biases in patient reports of symptoms might improve monitoring of clinical and research outcomes in people with neck pain.

Several studies have previously investigated the relevance of within-session changes in symptoms in patients undergoing manual therapy treatment. There is some evidence that symptom changes that occur within a treatment session are maintained between treatment sessions (Hahne et al., 2004; Tuttle, 2005; Tuttle et al., 2006; Tuttle, 2009), and tend to continue throughout the duration of care (Cook et al., 2012). There is also some evidence to suggest that changes in pain and disability scores during treatment correlate with self-reported rate of recovery (O'Halloran et al., 2013). This suggests a relationship between positive treatment responses and recovery in the very short term. The relationship between positive within-session treatment responses and longer-term recovery, however, is lacking. Further, the previous studies into the within-session responses to manual therapy concentrated primarily on the positive effects of manual therapy, such as improvement in pain and range of motion. Manual therapy can also result in a range of minor adverse effects (Hurwitz et al., 2005) most commonly increased neck pain and headache. Less is known about the effect of these adverse effects on recovery.

The aim of this study was to explore aspects of the immediate symptom responses to manual therapy treatment, in people with neck pain. Specifically, this study aimed to investigate

1. The typical clinical course of reported symptoms during a short episode of manual therapy care
2. The relationship between the immediate changes in reported pain following manual therapy and longer-term outcomes
3. The influence of minor adverse effects of manual therapy on longer-term outcomes
4. The consistency between pain scores reported by patients to practitioners and those recorded by patients in diaries.

2. Methods

2.1. Design

This study involved observational secondary data analysis from a randomized controlled trial (Leaver et al., 2010) that compared high-velocity thrust manipulation with non-thrust mobilization in people with a new episode of neck pain. The original randomized controlled trial demonstrated no difference in outcomes between the manipulation and mobilization groups. We were therefore able to combine both treatment groups for an observational study.

Participants in the randomized controlled trial kept a daily diary of pain scores and the participating practitioners recorded pre- and post-treatment pain scores at each treatment session. This provided an opportunity to explore the relationship between the short-term effects of manual therapy treatments and longer-term patient relevant outcomes, as well as other features of manual therapy care. The study was approved by the University of Sydney Human Research Ethics Committee and all participants provided written informed consent.

2.2. Participants

The study was conducted in 11 physiotherapy and chiropractic clinics in Sydney, Australia, between October 2006 and April 2008. Participants aged 18–70 years who were seeking care from a physiotherapist or chiropractor for a new episode of non-specific neck pain were recruited by their treating practitioner. Eligible participants had neck pain of less than three months duration that was preceded by at least one month without neck pain. Participants were excluded if they had whiplash-associated disorder, history of neck surgery, serious pathology (e.g. malignancy, infection, inflammatory disorder, fracture, radiculopathy or myelopathy), primary complaint other than neck pain, mild neck pain (<2/10 on a 0–10 point scale) or were unable to communicate in English. For the purpose of the associated randomized controlled trial, participants were also excluded if the treating practitioner deemed them unsuitable for neck manipulation. Participants from both groups (i.e. manipulation and mobilization) were included in the observational study.

2.3. Procedures

Baseline data were collected using participant questionnaires and practitioner assessment forms (Leaver et al., 2010). All participants were treated with up to four sessions of multimodal physical therapy that included manual therapy. The manual therapy that was provided to participants was either high velocity thrust manipulation or non-thrust mobilization according to the randomization schedule of the associated randomized controlled trial. Participants were followed for a period of three months after baseline assessment. The manual therapy treatments were applied pragmatically with the treating manual therapists selecting the target spinal segment, manual therapy technique and grade according to their clinical judgment. The treating practitioners were physiotherapists and chiropractors with post-graduate training and qualifications in spinal manipulative therapy, with at least two years of post-graduate experience. Participants completed a pain diary for three months. Diary entries were collected by telephone and transcribed weekly to minimize loss of data. An exit interview was conducted by telephone at three months to obtain participant's pain, activity and global perceived effect scores. The sample size was determined by the original trial and was powered to explore the differences between mobilization and manipulation in terms of speed of recovery.

2.4. Variables/outcomes

Demographic variables collected at baseline included age, sex, smoking habit, self-rated general health (5-point categorical scale) and compensation status. Clinical variables collected at baseline included pain intensity (numerical rating scale 0–10), duration of the current episode of neck pain in days, neck-related disability (Neck Disability Index 0–50), past history of neck pain, use of analgesic medications and the presence of associated symptoms

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