Manual Therapy 19 (2014) 215–221

Contents lists available at ScienceDirect

Manual Therapy

journal homepage: www.elsevier.com/math

Original article

Is one better than another?: A randomized clinical trial of manual therapy for patients with chronic neck pain

Honorio Izquierdo Pérez [a], Jose Luis Alonso Perez [a,b,f], Alfonso Gil Martinez [c,d], Roy La Touche [c,d], Sergio Lerma-Lara [d,e], Noelia Commeaux Gonzalez [b], Hector Arribas Perez [f], Mark D. Bishop [g], Josue Fernández-Carnero [b,h,*]

[a] Department of Physiotherapy, Universidad Europea de Madrid, Villaviciosa de Odon, Madrid, Spain
[b] Research Group in Musculoskeletal Pain and Motor Control, Universidad Europea de Madrid, Villaviciosa de Odon, Spain
[c] Hospital La Paz Institute for Health Research, IdiPAZ, Madrid, Spain
[d] Faculty of Health Science, Department of Physiotherapy, The Center for Advanced Studies University La Salle, Autonoma University of Madrid, Aravaca, Madrid, Spain
[e] Movement Analysis Laboratory, University Hospital Niño Jesus, Madrid, Spain
[f] Department of Physical Therapy, University Hospital del Henares, Coslada, Madrid, Spain
[g] University of Florida, Department of Physical Therapy, United States
[h] Department of Physical Therapy, Occupational Therapy, Rehabilitation and Physical Medicine, Universidad Rey Juan Carlos, Alcorcón, Madrid, Spain

ARTICLE INFO

Article history:
Received 22 July 2013
Received in revised form
19 November 2013
Accepted 13 December 2013

Keywords:
Manual therapy
Musculoskeletal manipulations
Chronic neck pain
Randomized controlled trial

ABSTRACT

Our purpose was to compare the effectiveness of three manual therapy techniques: high velocity, low amplitude (HVLA), mobilization (Mob) and sustained natural apophyseal glide (SNAG) in patients with chronic neck pain (CNP). The randomized controlled trial included patients with mechanically reproducible CNP, who were randomized to the treatment group. Outcome measures were the Visual Analogue scale (VAS), Neck Disability Index (NDI), Global Rating of Change (GROC) and Cervical Range of Motion (CROM). Two-way repeated measures analysis of variance compared outcomes at baseline, at the end of treatment and 1, 2 and 3 months after treatment. A total of 51 subjects completed the trial. No significant differences were found between HVLA, Mob and SNAG at the end of treatment and during the follow-up in any of the analysed outcomes. There were no differences in satisfaction for all techniques. The results lead to the conclusion that there is no long-term difference between the application of HVLA, Mob and SNAG in pain, disability and cervical range of motion for patients with CNP.

1. Introduction

The incidence of neck pain is increasing at a greater rate than other spine pain problems (Picavet and Schouten, 2003), incurring growing personal, social and health costs (Hoving et al., 2004). The expenditure on patients with neck pain is increasing at a faster rate than for other, more prevalent health problems (Martin et al., 2008). Most individuals will suffer neck pain at some time during the course of their lives (Carroll et al., 2008). Recently, a study reported that the 1-year prevalence in Spain was 19.5% (Fernandez-delas-Penas et al., 2011) and a third of these cases will transition into a chronic state (Cote et al., 2004).

The zygapophyseal joints are a source of neck pain (Bogduk and Aprill, 1993; Bogduk, 2011). Cervical mobilization and manipulation applied to these joints have demonstrable effects on the autonomic nervous system, the sensory system, neck range of motion and disability levels (Martinez-Segura et al., 2006; Schmid et al., 2008; Bialosky et al., 2009; Dunning and Rushton, 2009). Similarly, the sustained natural apophyseal glide (SNAG) technique produces sympathoexcitatory effects (Moulson and Watson, 2006) and increases in range of motion (McNair et al., 2007). SNAGs are recommended as a suitable manual technique for treatment of patients with neck pain (Mulligan, 1999; Hearn and Rivett, 2002). Nevertheless, no studies have compared the effects of this technique with those of other manual therapies more commonly used on patients with neck pain, which was one factor which prompted this study.

* Corresponding author. Facultad de Ciencias de la Salud, Departamento de Fisioterapia, Terapia Ocupacional, Medicina Física y Rehabilitación, Universidad Rey Juan Carlos, Avenida de Atenas s/n, 28922 Alcorcón, Madrid, Spain. Tel.: +34 91 488 89 59; fax: +34 91 488 89 57.
E-mail addresses: josue.fernandez@urjc.es, josuefernandezcarnero@gmail.com (J. Fernández-Carnero).

1356-689X/$ – see front matter © 2014 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.math.2013.12.002

There are potential adverse effects related to cervical manipulation (Leon-Sanchez et al., 2007), especially the possibility of neurovascular injuries (Thomas et al., 2011, 2012a, 2012b). For this reason, recommendations have been made to avoid manual therapy (MT) at terminal ranges of motion (Childs et al., 2005). Cautions have been given against the use of cervical high-velocity low-amplitude (HVLA) techniques, especially in specific subgroups of the population (Kerry and Taylor, 2009). Before HVLA is avoided due to these risks, there is a need to determine if HVLA has any superior effects to low velocity techniques such as SNAGs or other mobilization techniques.

A study was undertaken to better understand the clinical effects of the SNAG technique and also where there were any differences in its effects compared to other common manual therapy techniques in patients with neck pain. Saavedra-Hernandez et al. (2012) reported that there is a correlation between cervical range of motion and pain. The SNAG technique involves a series of repeated movements aimed at gaining range and reducing pain (Hearn and Rivett, 2002). Thus we hypothesized that SNAGs would have better effects than mobilization and HVLA techniques. To test this hypothesis, this study compared the immediate and short-term effectiveness of HVLA, Mob and the SNAG techniques on measures of pain, disability, mobility and the global rating scale for patients with chronic neck pain.

2. Methodology

2.1. Design

This study was a parallel-group double blind randomized clinical trial (see http://www.clinicaltrials.gov. Identifier: NCT01792895). The randomization schedule was prepared using Graphpad (Graphpad Software, Inc CA 92037 USA) before enrolment and treatment group was concealed in opaque envelopes. The assessor undertaking baseline measures was blind to the subject's group and patients were also blinded/uninformed to the type of treatment technique received. This study was approved by the Ethics Committee Board. All patients completed the informed consent process.

2.2. Subject selection

Sixty-nine patients with mechanical neck pain aged between 20 and 65 years were assessed for eligibility by a primary care physician. The study was conducted in the Valleaguado Primary Health Care Centre in Coslada, Spain over 10 months from October 2011 to June 2012. Once a patient was deemed eligible and accepted into the study, an envelope was selected and the patient was randomized to one of three MT groups. Nineteen were randomized to the HVLA group, 21 to the Mob group and 21 to the SNAG group. The patients were instructed not to discuss the MT procedure received with the examiner.

Inclusion criteria were pain perceived anywhere in the posterior region of the cervical spine, from the superior nuchal line to the first thoracic spinous process (Merskey and Bogduk, 1994) of more than 12 weeks duration and without radicular symptoms radiating to the head, trunk and/or the upper limbs. Patients were not considered if they reported any of the following conditions: pregnancy, neck pain associated with whiplash injuries, medical red flag history (tumour, fracture, metabolic diseases, rheumatoid arthritis, osteoporosis, resting blood pressure greater than 140/90 mmHg), neck pain with cervical radiculopathy, neck pain associated with externalized cervical disc herniation, fibromyalgia syndrome, previous neck surgery, neck pain accompanied by vertigo caused by vertebrobasilar insufficiency or accompanied by non-cervicogenic headaches. People were also not considered if they had received physical therapy in the previous 6 months, had pending legal action (compensation for injury, labour), psychiatric disorders or other problems that could contraindicate the use of techniques in this study.

2.3. Interventions

All groups were assessed by a physiotherapist with more than 10 years of clinical experience. A standardized musculoskeletal examination of the cervical spine was performed to identify the vertebral level to target with the intervention; that is, the level found to be hypomobile and painful in the manner that matched the patients' primary complaint. Each patient received a total of 4 treatment sessions over 2 weeks. Four sessions were chosen, taking as a reference a similar study by Leaver et al. (2010).

2.3.1. HVLA Group

The patient lay supine with the cervical spine in a neutral position. The therapist applied contact over the posterolateral aspect of the zygapophyseal joint of the hypomobile vertebra. The therapist performed the technique taking into account the most limited movement: lateral flexion or rotation. A maximum of 2 thrusts were performed on each subject regardless of audible cavitation (Flynn et al., 2003; Cleland et al., 2007).

2.3.2. Mob group

The patient lay prone and the therapist stood at the head of the patient. His thumbs were placed in opposition at the level of the facet of the hypomobile cervical vertebra and a unilateral posteroanterior (PA) oscillatory pressure was applied (Sterling et al., 2001). This oscillatory mobilization was performed at a frequency of 2 Hz (with metronome control/steps) for 2 min and repeated 3 times. The rest time between each mobilization was 1 min.

2.3.3. SNAG Group

The patient was in a sitting position. The therapist located the hypomobile and painful level and placed his thumbs on the transverse process of that level. Then, the subject performed the painful motion actively while the therapist guided that vertebra during the movement and resisted it when returning to neutral. The force was applied parallel to the plane of the joint (Exelby, 2002), and the procedure was performed in 3 sets of 10 repetitions.

2.4. Outcome measures

2.4.1. Primary outcomes

2.4.1.1. Pain intensity. A Visual Analogue Scale (VAS) was used to evaluate the intensity of the recent pain perceived by the patient (Huskisson, 1974). This scale has been documented in previous studies as a reliable and valid measure of pain intensity (Jensen et al., 1999; Katz and Melzack, 1999) and it is sensitive to clinical changes in pain (Guzman et al., 2008). The patient places a vertical mark on a 10 cm horizontal line anchored at one end with 0 (no pain) and at the other end with 10 (maximum pain). A change of 1.1–1.2 cm indicates a minimal improvement, which is clinically significant (Emshoff et al., 2011).

2.4.2. Secondary outcomes

2.4.2.1. Disability of the neck. The Neck Disability Index (NDI) is an assessment tool used to record perceived disability in patients with neck pain (Vernon and Mior, 1991). The NDI is a self-administered questionnaire with 10 sections: 7 relate to activities of daily living, 2 relate to pain and 1 to concentration. Each of the sections is scored from 0 to 5, and the total score is expressed as a percentage