



Review article

Manual therapy, exercise therapy or combined treatment in the management of adult neck pain – A systematic review and meta-analysis



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ABSTRACT

Background: Neck pain is a common and often disabling musculoskeletal condition. Two therapies frequently prescribed for its management are manual therapy (MT) and exercise therapy (ET), and combining these treatment approaches are common.

Objective: To assess whether or not combined treatment consisting of MT and ET is more effective than either therapy alone in relieving pain and improving function in adult patients with grade I–II neck pain.

Design: Systematic review with meta-analysis.

Methods: A systematic search on EMBASE, MEDLINE, AMED, CENTRAL and PEDro were performed until June 2017. Randomized controlled trials with adult grade I–II neck pain patients were included if they investigated the combined effect of MT and ET to the same ET or MT alone, and reported pain intensity or disability on numerical scales. Quality of life was assessed as a secondary outcome. Quality of the included trials was assessed with the PEDro scale, and the quality of evidence was assessed with GRADE.

Results: 1169 articles were screened, and 7 studies were included, all of which investigated the addition of ET to MT. Only very small and non-significant between group differences was found on pain intensity at rest, neck disability, and quality of life at immediate post-treatment, 6 months, and 12 months follow-up. The quality of evidence was moderate for pain-at-rest outcomes and moderate to low for neck disability and quality of life outcomes.

Conclusion: Combined treatment consisting of MT and ET does not seem to be more effective in reducing neck pain intensity at rest, neck disability or improving quality of life in adult patients with grade I–II neck pain, than ET alone.

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1. Introduction

Neck pain is a common and often disabling musculoskeletal condition, and it is the fourth leading cause of years lived with disability around the world (Lancet, 2012). Reports of annual prevalence rates in the general population averages at 37.2% (Fejer et al., 2006), and a substantial proportion of people experiencing onset of neck pain seek healthcare the following year (Vasseljen et al., 2013; Woodhouse et al., 2016). Health professionals face tremendous challenges in clinical decision-making when it comes

to managing neck pain due to a variety of available treatments and often limited and conflicting reports of treatment effectiveness (Cohen, 2015).

Neck pain can be classified into grade I–IV, depending on whether or not the pain affects activities of daily living (grade I–II), the pain is accompanied by neurological signs (grade III) or there are signs of major structural pathology (grade IV) (Guzman et al., 2009). This model is useful in terms of classifying neck pain into homogeneous groups, as a different treatment approach might be warranted for grade 1–2 than grade 3–4 (Guzman et al., 2008). This classification also includes patients with whiplash-associated disorders. Pain can be classified into short duration (pain for less than 12 weeks), and long duration neck pain (pain for 12 weeks or more).

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Two of the most widely used treatment strategies for the management of neck pain is exercise therapy (ET) and manual therapy (MT) (Bogduk and McGuirk, 2007). ET may be defined as a regimen or plan of physical activities designed and prescribed for any therapeutic goals, which includes strength exercises, stabilization exercises and endurance exercises, among others (Chodsko-Zajko et al., 2009). MT may be defined as “the use of hands to apply a force with a therapeutic intent” (Smith, 2007). Widely used MTs are spinal manipulative therapy (SMT), joint mobilization and massage. Both ETs and MTs have been shown to relieve symptoms in various musculoskeletal conditions (Lorås et al., 2015; Gross et al., 2015, 2016).

Various rationales have been proposed for the two broad approaches towards management of neck pain. Effects of ETs are typically attributed to various pain modulating mechanisms (e.g., exercise-induced hypoalgesia, reduced temporal summation of pain and/or altered pain perception) (Naugle et al., 2012; O'Connor et al., 2015; Vaegter et al., 2015). Treatment effects of MTs, on the other hand, are often explained in terms of favorable changes in the treated tissue, changes in central pain modulation and effects from the gate-control mechanisms (Ernst, 2000; Lascrain-Aguirrebena et al., 2016; Maigne and Vautravers, 2003; Vigotsky and Bruhns, 2015).

The heterogeneity in neck pain patient characteristics (Leaver et al., 2013) and the lack of a clear understanding of pain modulating mechanisms of ETs and MTs and their efficacy in relieving symptoms, might lead health professionals to advocate a multi-modal approach with a combination of these therapies in the attempt to affect several of the suggested mechanisms. However, it appears that no systematic review has been conducted on the combined effects of MT and ET compared to either of these therapies alone. The specific aim of this systematic review is therefore to review the current body of evidence of randomized controlled trials in order to assess whether or not combined treatment consisting of MT and ET is more effective than either therapy alone in relieving pain and improving function in adult patients with grade I and II neck pain.

2. Methods

2.1. Electronic searches

A systematic search for relevant publications were performed in the following computerized bibliographic databases: MEDLINE (Ovid), EMBASE (Ovid), AMED (Ovid), CENTRAL, and PEDro. The databases were searched from their inception to June 2017. Key-words included trial terms (random*, trial, group), symptom terms (neck, cervical, pain, ache) treatment terms (manual therapy, massage, traction, mobilization, manipu*, active, exerci*, training). Titles including the words cancer, carcinoma, femur, femoral and fracture were excluded. The complete database search strategy can be found in Table 1. PEDro was searched combining the keyword exerci* with stretching, massage, manipulation or massage; pain; head or neck; musculoskeletal; and clinical trial.

Table 1
Detailed search strategy for randomized controlled trials.

Search	Database field
#1 random* OR trial OR groups	All fields (1)
#2 neck OR cervical	All fields (1, 2)
#3 pain OR ache	All fields (1, 2)
#4 manual therapy OR massage OR manipu* OR mobilization OR traction	All fields (1, 2)
#5 active OR exerci* OR training	All fields (1, 2)
#6 #1 AND #2 AND #3 AND #4 AND #5	
#7 cancer OR carcinoma OR femur OR femoral OR fracture	Title (1, 2), abstract and keyword (2)
#8 #6 NOT #7	

1 = MEDLINE, EMBASE and AMED; 2 = CENTRAL.

2.2. Searching other resources

Reference lists of the included studies and review articles on similar topics were screened for relevant publications.

2.3. Study selection

The literature search was performed by both review authors, who independently selected studies and assessed these against the inclusion and exclusion criteria. The inclusion criteria were: (1) randomized controlled trial (RCT); (2) patient age >18 years; (3) grade I-II neck pain; (4) comparing one or more MTs and one or more ETs to the same MTs or ETs alone; and (5) reported pain intensity and/or neck disability on numerical scales as outcome measures. The exclusion criteria were: (1) patients had known underlying pathology or radicular signs; (2) mixed populations studies (e.g. neck and shoulder pain); (3) study population consisting of a specific subgroup of neck pain patients other than patient demographics (e.g. inclusion criteria were headaches or a previous history of trauma to the neck); (4) groups received additional therapies (electrotherapy, needling therapies, thermotherapy, relaxation therapy, etc.); and (6) trial participants received preliminary treatment before baseline measures. General information and advice were allowed as co-intervention if it provided for all groups relevant to this review. Non-full text articles, pilot studies and articles written in other languages than English were excluded.

2.4. Data extraction

Data extraction was performed by the first author, and checked by the second author. Data extracted included intervention descriptions, patient demographic data, time to follow-up, and means and standard deviations for pain, disability and quality of life baseline, follow-up, and change scores. Neck Disability Index (NDI) scores that were not presented as percentages were converted prior to analysis in order to enable a comparison of scores between trials (Hoving et al., 2003). Pain outcomes reported as pain at rest, average pain intensity, current pain intensity, or simply *pain* was grouped together as pain at rest.

2.5. Quality assessment

Both review authors independently assessed the methodological quality of the included trials with the Physiotherapy Evidence Database (PEDro) scale. The PEDro scale is a multi-item scale consisting of 11 items that addresses various aspects of the study methodology. A PEDro score of 0–10 is obtained by summation (item 1 is not scored), with a higher score representing a greater methodological quality. The scale has been demonstrated to be valid and sufficiently reliable for assessing methodological quality of RCTs (de Morton, 2009; Maher et al., 2003). Trials will be considered high quality if they score six or higher on the PEDro scale (Maher, 2000).

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