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Original Contribution

Complementary therapies in addition to medication for patients with nonchronic, nonradicular low back pain: a systematic review☆

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ABSTRACT

Background: A total of 2.7 million patients present to US emergency departments annually for management of low back pain (LBP). Despite optimal medical therapy, more than 50% remain functionally impaired 3 months later. We performed a systematic review to address the following question: Among patients with nonchronic LBP, does spinal manipulation, massage, exercise, or yoga, when combined with standard medical therapy, improve pain and functional outcomes more than standard medical therapy alone?

Methods: We used published searches to identify relevant studies, supplemented with our own updated search. Studies were culled from the Cochrane Register of Controlled Trials, Medline, EMBASE, CINAHL, and the Index to Chiropractic Literature. Our goal was to identify randomized studies that included patients with nonradicular LBP of <12 weeks' duration that compared the complementary therapy to usual care, sham therapy, or interventions known not to be efficacious, while providing all patients with standard analgesics. The outcomes of interest were improvement in pain scores or measures of functionality.

Results: We identified 2 randomized controlled trials in which chiropractic manipulation + medical therapy failed to show benefit vs medical therapy alone. We identified 4 randomized controlled trials in which exercise therapy + medical therapy failed to show benefit vs medical therapy alone. We did not identify any eligible studies of yoga or massage therapy.

Conclusions: In conclusion, for patients with nonchronic, nonradicular LBP, available evidence does not support the use of spinal manipulation or exercise therapy in addition to standard medical therapy. There is insufficient evidence to determine if yoga or massage is beneficial.

1. Background

Low back pain (LBP) is a very common reason for an emergency department (ED) visit, resulting in 2.7 million visits to US EDs annually [1]. Among an unselected ED LBP population, outcomes are generally poor; more than 50% of these patients report persistent pain and functional impairment 3 months later [2]. Even among patients with acute, new-onset LBP, 20%-25% of patients report persistent pain and functional impairment at the 3-month mark [3]. Medical therapy for LBP is of only modest benefit. Adding a skeletal muscle relaxant or an opioid to standard therapy with a nonsteroidal anti-inflammatory drug does not improve 3-month outcomes [3]. A variety of complementary or alternative therapies may be useful for patients with LBP. Chiropractic manipulation, massage, exercise therapy, and yoga are commonly recommended for patients with LBP. However, published data on these therapeutic modalities have been gathered in heterogeneous populations using differing methodologies, thus making interpretation difficult for emergency physicians [4-7]. The goal of this work is to clarify the role of these 4 types of complementary therapies for ED patients with nonradicular, nonchronic LBP who are treated with appropriate medical therapy. Specifically, we reviewed the published literature systematically to determine whether chiropractic manipulation, massage, exercise therapy, or yoga, when added to typical medical care, would improve short- or long-term pain and functional outcomes more than typical medical care alone among patients with nonchronic LBP.

2. Methods

2.1. Overview

This is a "piggy-back" systematic review of the published literature to determine whether spinal manipulation, massage, exercise therapy, or yoga, when combined with standard care, is more effective in improving pain and functionality scores than standard care alone among ED patients with acute or subacute LBP. To answer our question of interest, we extracted relevant data from 4 previously published high-

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quality systematic reviews on each of these 4 topics (manipulation, massage, exercise, yoga) and then supplemented the published systematic reviews with our own updated literature search.

2.2. Selection criteria

We included randomized studies of patients with acute or subacute nonradicular LBP. For the purpose of this analysis, we defined *acute* as LBP duration of less than 1 month and *subacute* LBP as at least 1 month in duration but less than 3 months. Because patients with radicular LBP may be treated differently than patients without radicular symptoms, we excluded studies in which the majority of patients had radicular symptoms, sciatica, or known spinal pathology. Because our research question involves improving upon rather than replacing standard medical therapy, we only included randomized studies in which, by protocol, all patients were treated with a standard medical therapy, which we defined as a nonsteroidal anti-inflammatory agent, acetaminophen, a skeletal muscle relaxant, an opioid, or a benzodiazepine. Thus, all patients included in this analysis received standard care with or without a complementary therapy. Finally, because we sought evidence of efficacy, we only included studies in which the complementary modality was compared with no care; an inactive control, such as a sham therapy; or a therapy known to be ineffective.

2.3. Search strategy

We identified updated high-quality systematic reviews on each of the 4 complementary therapies of interest [4-7]. However, these reviews were not tailored to our specific goal: to identify complementary therapies that are useful adjuvants to standard medical therapy among patients with nonchronic, nonradicular LBP. Rather than repeating the search, we relied upon the studies identified in each of these reviews but then further winnowed the identified studies to meet our selection criteria. To determine whether or not a particular randomized controlled trial (RCT) included by the published author group was eligible for our study, 2 of us reviewed the study in detail and independently determined whether or not the original RCT was eligible for our study. Our original plan was to resolve disagreement through discussion, although that was not necessary because both reviewers agreed on all studies.

To identify relevant studies published subsequent to the searches performed in each of these systematic reviews, we updated the search as follows. We searched Medline and Cochrane Central using the original authors' search strategy encompassing the time from the original search date until May 2016. For this updated search, 1 author identified potentially eligible studies. Final eligibility was determined by discussion.

When data were missing or unclear, we attempted to contact study authors.

2.4. Outcomes of interest

The primary outcomes of interest for this analysis were improvement in LBP or LBP-related functional impairment. Pain assessments were typically performed using patient rating scales such as a visual analog scale or a numerical rating scale for pain. LBP-related functional impairment was measured using disease-specific instruments such as the Oswestry Disability Index.

2.5. Bias

For studies identified by the original systematic review, we report the assessment of bias originally reported. For studies identified in our updated search, we used the Cochrane assessment of bias instrument.

2.6. Analysis

We had hoped to identify a sufficient number of similar studies so that the results could be aggregated. This was not the case. Therefore, we report the results for individual studies and summarize results qualitatively.

3. Results

We identified 2 RCTs of spinal manipulation, 4 of exercise therapy, and none for either yoga or massage that met our search criteria (Figure).

3.1. Spinal manipulation

Of 20 studies on spinal manipulation identified in the initial review, we excluded all but 2 (Table 2A). Four studies compared different types of manipulation to each other and thus did not have an inactive control. The remaining 14 studies did not administer standard medical therapy to all patients.

Our updated search identified 195 new unique references. None of these met our selection criteria. Reasons for exclusion are detailed in Figure A.

The 2 studies that met our selection criteria are discussed below (Table 1).

Hancock et al [8]

This study enrolled 240 patients with back pain duration of less than 6 weeks who presented to a general practitioner (GP) in Sydney, Australia. Patients were randomized to 1 of 4 groups: diclofenac 50 mg, twice daily + sham therapy; placebo tablets + spinal manipulation; both diclofenac and spinal manipulation; or placebo tablets + sham therapy. All patients received a prescription for acetaminophen 1 g 4 times daily and general LBP advise from their GP. Manipulation consisted of mobilization techniques and high-velocity thrusts adapted to the patient's clinical presentation. Each patient received 2 or 3 treatment sessions per week for 4 weeks to a maximum of 12 treatments. The primary outcome, number of days to sustained pain freedom, did not differ among the groups. Similarly, secondary outcomes, which included measures of pain, functional impairment, and patient perceptions, did not differ meaningfully between any of the groups.

Juni et al [9]

This study randomized 104 Swiss ED or general practice patients with back pain duration of less than 4 weeks to standard care with or without spinal manipulation. Standard care consisted of acetaminophen, diclofenac, and dihydrocodeine, as well as typical LBP advice. Manipulation treatment consisted of high-velocity, low-amplitude thrusts; spinal mobilization; and muscle energy techniques. Patients received a maximum of 5 sessions of therapy over the course of 2 weeks. There were no statistically significant differences between the groups with regard to pain scores or analgesic use.

3.2. Yoga

Of 11 studies on yoga identified in the initial review, all 11 included only patients with chronic LBP and were therefore excluded from this analysis (Table 2B).

Our updated search identified 57 new unique references. None of these met our selection criteria. Reasons for exclusion are detailed in Figure B.

3.3. Massage

Of 16 studies identified by the initial review, none were eligible for this analysis. Eight of the studies included chronic pain patients. Five

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