Complementary Therapies in Medicine (2013) 21, 1—7

Available online at www.sciencedirect.com

SciVerse ScienceDirect

journal homepage: www.elsevierhealth.com/journals/ctim

Strain—counterstrain to treat restrictions of the mobility of the cervical spine in patients with neck pain—A sham-controlled randomized trial☆,☆☆

Reinhold Klein, Alexa Bareis, Antonius Schneider, Klaus Linde*

Institute of General Practice, Techni-sche Universität München, Munich, Germany
Available online 7 December 2012

KEYWORDS
Osteopathic manipulation;
Strain—counterstrain;
Randomized controlled trial;
Neck pain;
Cervical spine

Summary
Objective: Strain—counterstrain is an osteopathic technique which is widely used for treating mobility restrictions in the neck. We aimed to investigate whether a single strain—counterstrain intervention is more effective than a sham intervention in improving restricted cervical range of motion in patients with neck pain.
Methods: 61 adult patients with neck pain and restricted cervical mobility were randomly allocated to receive either a single strain—counterstrain intervention or a sham treatment. After outcome measurement all patients received full individualized osteopathic treatment. Mobility of the cervical spine was measured by a blinded observer using the Cervical Range of Motion (CROM) tool. In addition, patients rated pain intensity and assessed the treatment effect. The main outcome measure was the sum of changes in mobility restriction (in %) after treatment compared to normal mobility.
Results: All patients completed the study. Mobility restriction decreased by 2.0% (SD 6.9%) in the group receiving strain—counterstrain treatment and 0.6% (SD 5.7%) in the group receiving sham treatment (mean difference 1.5%, 95% confidence interval −1.7 to 4.8%; $p = 0.35$). There were no significant differences between groups for secondary outcomes. After receiving the full osteopathic treatment the group initially receiving strain—counterstrain improved by another 4.2% (7.0%; $p = 0.003$) and the group initially receiving sham by another 5.6% (SD 6.8%; $p < 0.001$).
Conclusions: Strain—counterstrain as a single intervention did not have immediate effects on mobility and pain over a sham treatment. Future studies should probably focus on the investigation of full osteopathic treatment.

Introduction

Neck pain is a very common condition affecting about half of all individuals at some point during their life.[1] In most cases no clear pathology can be detected and the neck pain is considered non-specific.[2] A common finding in many patients with neck pain is a reduced cervical range of motion.[3] While evidence for their effectiveness is yet limited[4,5] osteopathic

☆ There was no external funding for the study.
☆☆ Trial identification number: DRKS00000691.
* Corresponding author at: Institute of General Practice, Technische Universität München, Orleansstr. 47, 81667 München, Germany. Tel.: +49 89 6146589 16; fax: +49 89 6146589 15.
E-mail address: Klaus.Linde@lrz.tum.de (K. Linde).

0965-2299/$ — see front matter © 2012 Elsevier Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.ctim.2012.11.003

interventions are increasingly used by both physicians and other health care professionals for treating neck pain and other musculoskeletal pain.[6] Osteopathic treatment typically involves complex manual techniques to diagnose and treat somatic dysfunctions in the musculoskeletal system, inner organs and the nervous system.[6] Strain—counterstrain is one osteopathic technique which is widely used (often together with other osteopathic techniques) when treating pain and mobility restrictions in the neck. It involves passive body positioning, which is claimed to elicit immediate and prolonged reductions in tenderness at digitally tender points and to reduce pain and dysfunction associated with musculoskeletal conditions.[7] Due to its relatively gentle character it is considered a safe technique associated with lower risk than high-velocity manipulations.[7] A survey published in 2003 found that strain—counterstrain was the forth most commonly used manipulative technique among providers of osteopathy in the US.[8] The most common explanation for the effects of strain—counterstrain is that it influences aberrant neuromuscular activity mediated by muscle spindles, local circulation and inflammatory reactions.[9] Clinical research into the effects of strain—counterstrain has only begun to emerge in recent years (see[9] for a review).

To the best of our knowledge, randomized trials investigating the effects of strain—counterstain on the range of motion in patients suffering from neck pain have not been published. In the study described below we aimed to investigate whether a single strain—counterstrain intervention is more effective than a sham intervention in reducing the mobility restriction in patients with neck pain. In addition, we aimed to obtain preliminary data on whether changes of mobility are more pronounced after application of a full osteopathic treatment.

Methods

Design

The main part of the study was a randomized controlled trial with patients, the study assistant and outcome assessor (AB) blinded. The random sequence was created by the study methodologist (KL) using Research Randomizer (www.randomizer.org) with variable block sizes of 8, 10 and 12 (permuted block design). A student not involved in the study prepared sequentially numbered, opaque, sealed envelopes prepared according to the recommendations by Doig and Simpson.[10] After inclusion of a patient into the study by the treating physician (RK) the participant received a code number and went to the study assistant for the baseline measurement of cervical mobility (see below). After completion of the measurement the patient received the envelope with the corresponding code number and went back to the physician who opened the envelope and provided the allocated treatment (strain—counterstrain or sham intervention). After a second measurement all patients received a full individualized osteopathic treatment and were measured a third time. All patients provided written and oral informed consent. The study was approved by the ethics committee of the Medical Faculty of the Technische Universität München.

Patients

Patients were recruited in a large private general practice in Bavaria, Germany. To be included patients had to be between 18 and 65 years old, had to have an acute episode of non-specific neck pain and a blocking of cervical joints in the manual investigation. A blocking was identified finding an irritation-point and restriction of the range of motion in one or more cervical joints of the cervical spine. Most patient had recurrent or chronic complaints and had undergone a variety of diagnostic tests and therapeutic interventions in the past. Patients were excluded if manual therapy was contra-indicated (inflammation, trauma with injury of anatomic structures, severe osteoporosis, severe degenerative changes in the cervical spine, anomalies of the A. vertebralis, severe mental disorder) and if measurement with a magnetic device could have implied a risk for the patient.

Intervention

At inclusion into the study all patients were examined manually. Patients allocated to the intervention group then received a strain—counterstrain treatment according to the diagnostic findings. The affected body parts were positioned to the free direction contrary to the restriction. To activate neurophysiologic reflex mechanisms, this position was held for 90 s while the tender point was monitored by using the finger of the therapist in the position with the minimal tension of the tender point. Afterwards, a slow reposition to basic position was carried out.

To carry out the sham treatment, the finger of the therapist was placed at the height of C4 paravertebraly on the right hand side of the dorsal part and the head was rotated by 30° to the left to basic position without any flexion, extension or lateral flexion. This position was also held for 90 s. Afterwards, a slow reposition to basic position was carried out.

All treatments were performed by the first author, a general practitioner with additional qualifications in sports medicine and manual therapies. He has completed the full osteopathic curriculum (postgraduate) of the Deutsch-Amerikanische Akademie für Osteopathie (German-American Academy of Osteopathic Medicine) in cooperation with the Philadelphia College of Osteopathic Medicine (Certificate and Diploma Osteopathic Medicine, EROP Diploma Osteopathic Medicine TM) and has 8 years of experience in using osteopathic treatments.

After receiving the allocated treatment patients underwent a second measurement. Then all patients received the complex, individualized osteopathic intervention they would have received in routine practice outside the study. Depending on the individual situation various combinations of osteopathic techniques were added to the counterstrain treatment (for example, myofascial release, muscle energy technique, craniosacral treatment and high velocity low amplitude mobilization).

Measurements

At study entry patients were asked to fill in a questionnaire which included questions on age, sex, body size, weight,