

Effects of Cervical Versus Thoracic Mobilizations on Cervical Range of Motion, Pain Rating, and Neck Disability Index Scores

Erin Bartel, Michelle Cortese, Dustin Downing, Nathan Houseman*, Matthew Vermillion, Katie Wadsworth
Faculty: Michael A. Rogers

Department of Physical Therapy, College of Health Professions

Abstract. Neck pain affects between 45% and 54% of the population. The purpose of this study was to compare two different, yet commonly accepted treatments for neck pain. In a randomized trial, 34 subjects were divided into two groups and received joint mobilizations to the thoracic or cervical spine. Outcomes were measured by assessing change in cervical spine range of motion, neck pain as rated on the numeric pain rating system (NPRS), and function as indicated by the Neck Disability Index (NDI) questionnaire. Analysis revealed no significant interaction between cervical and thoracic mobilizations with regard to the NDI, NPRS, or cervical ROM.

1. Introduction

Mechanical neck pain is a common condition being treated in outpatient physical therapy clinics [1]. Physical therapy is often the first approach to treating neck pain; manual therapy is frequently the preferred technique [2]. Spinal mobilizations are a common manual therapy technique. Mobilizations are defined as passive, low velocity movements to a joint, utilizing high or low amplitude movements within the joint space, applied rhythmically [3]. Although previous studies support the efficacy of mobilizations in general, little research exists to conclude whether mobilizations at the cervical or thoracic spine are more effective. An understanding of the interaction of each intervention on neck pain rating, cervical range of motion (ROM), and self-reported function, could benefit and guide clinicians in enhancing therapeutic outcomes.

2. Experiment

Thirty-four individuals were selected for this study. Participants reported a history of neck pain within the last three months. Exclusions included history of neck or back surgeries, osteoporosis, osteopenia, motor vehicle accident within the last three months, pregnancy, known aversions to mobilizations or lying prone.

Prior to treatment, each participant filled out the NPRS to rate current neck pain and the NDI questionnaire to reveal how current pain affected daily function. After pretests, cervical ROM measurements were gathered with universal goniometers in the following order: flexion, extension, right and left rotation, and right and left lateral flexion.

Each participant was randomly assigned into cervical or thoracic mobilization groups. One licensed physical therapist performed all mobilizations. Mobilizations were performed on the cervical or thoracic spine at 6 vertebral levels, for 30 seconds each with a grade 4 posterior-anterior technique. Only the clinician performing the mobilizations was aware of each subject's assignment. After treatment each participant had all ROM measurements re-measured. Last, subjects verified neck pain after treatment with the same NPRS. All participants were encouraged to continue their present lifestyle during the one-week measurement interval, including maintaining current physical activity level, and not partaking in any other interventions for neck pain. After one week, subjects returned to complete three post-tests: the NPRS, the NDI, and all six ROM measurements.

Results

Before the study, researchers believed there would be a significant interaction between cervical and thoracic mobilizations as measured by neck pain, functional impairment, and cervical ROM, with cervical mobilizations being more effective than thoracic. However, findings showed there was no significant difference between any outcomes following cervical and thoracic mobilizations.

Summary of Physical and Self-Reported Outcome			
Findings			
Outcome/Group Post	Baseline	Immediately Post	1 Week
NDI (0-50)			
Cervical	6.1 ± 3.7		4.9 ± 3.6
Thoracic	5.6 ± 3.4		4.0 ± 3.7
NPRS (0-10)			
Cervical	2.2 ± 2.0	1.4 ± 1.2	1.6 ± 1.7
Thoracic	1.8 ± 1.7	1.4 ± 1.6	1.2 ± 2.0
Cervical Flexion			
Cervical	64.1 ± 8.9	66.5 ± 6.9	69.1 ± 6.8
Thoracic	67.0 ± 10.5	69.2 ± 8.6	67.7 ± 8.9
Cervical Extension			
Cervical	53.6 ± 8.7	57.4 ± 10.6	56.1 ± 10.1
Thoracic	54.8 ± 11.8	57.1 ± 10.3	59.3 ± 10.1
Left Cervical Lateral Flexion			
Cervical	32.1 ± 8.4	33.0 ± 8.5	33.3 ± 8.2
Thoracic	34.0 ± 6.5	33.9 ± 7.4	36.0 ± 6.4
Right Cervical Lateral Flexion			
Cervical	33.1 ± 8.1	33.3 ± 8.1	36.5 ± 7.7
Thoracic	34.5 ± 6.9	35.5 ± 6.5	39.2 ± 4.3
Left Cervical Rotation			
Cervical	74.5 ± 9.1	76.8 ± 7.4	78.8 ± 6.5
Thoracic	76.2 ± 6.6	77.9 ± 6.8	80.3 ± 8.3
Right Cervical Rotation			
Cervical	73.4 ± 10.3	75.8 ± 8.6	77.7 ± 6.6
Thoracic	75.5 ± 8.7	77.6 ± 8.0	80.3 ± 7.9

*Values are mean ± SD (95% confidence interval).

Discussion

A significant limitation was the population from which the sample was drawn. Participants were adults aged 18-35 who met inclusion criteria and were all Doctor of Physical Therapy students. While all met inclusion criteria of experiencing neck pain in the prior three months, few reported significant neck pain at the time of treatment, limiting improvement. Participants did not present as typical patients with neck pain, due in part to some of our exclusion criteria prohibiting individuals with a traumatic injury and over the age of the 35.

3. Conclusions

With no significant interaction between groups, we conclude that neither cervical nor thoracic mobilizations are more effective at treating neck pain in the population assessed. Therefore, one could consider that both interventions may be beneficial when treating patients with mechanical neck pain.

4. References

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