

# Immediate Effects on Electromyographic Activity and Pressure Pain Thresholds After a Cervical Manipulation in Mechanical Neck Pain: A Randomized Controlled Trial

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## Abstract

### Objective

The purpose of this study was to identify the immediate effects of a manipulation of C5/C6 level on electromyography (EMG) of the deltoid muscle and in pressure pain thresholds (PPTs) in patients with mechanical neck pain.

### Methods

Thirty-seven subjects with mechanical neck pain were randomly divided into 2 groups: manipulative group, which received a cervical spine manipulation targeted to C5/C6 segment, and a control group, which did not receive any procedure. Outcomes were EMG data of the deltoid muscle (rest, isometric contraction for 5 or 30 seconds, and isotonic contraction) and PPT over upper trapezius and deltoid muscles and C5 spinous process. They were assessed before and 5 minutes after treatment by a blinded assessor. A 3-way repeated-measures analysis of variance was used to examine the effects of the manipulation.

### Results

A significant group time interaction for MF at the beginning of isometric contraction for 30 seconds ( $F = 7.957$ ,  $P = .006$ ) was also found: the manipulative group experienced a greater increase in MF at the beginning of the isometric contraction than did the control group. A significant group time interaction was also found for root mean square during isometric contraction for 30 seconds ( $P = .003$ ); however, changes were small. Patients within the manipulative group experienced an increase on PPT over the deltoid ( $P = .010$ ) and C5 spinous process ( $P = .025$ ), but not over upper trapezius ( $P = .776$ ).

### Conclusions

Manipulation at C5/C6 level in the study participants seemed to increase EMG amplitude signal and fatigue resistance in a nonspinal (deltoid) muscle innervated by the same segment in patients with mechanical neck pain. However, these changes were relative small. An increase on PPT over those tissues innervated by the manipulated segment was also found after the manipulative procedure.