

# Changes in Biochemical Markers of Pain Perception and Stress Response After Spinal Manipulation

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**Study Design** Controlled, repeated-measures, single-blind randomized study.

**Objectives** To determine the effect of cervical or thoracic manipulation on neurotensin, oxytocin, orexin A, and cortisol levels.

**Background** Previous studies have researched the effect of spinal manipulation on pain modulation and/or range of movement. However, there is little knowledge of the biochemical process that supports the antinociceptive effect of spinal manipulation.

**Methods** Thirty asymptomatic subjects were randomly divided into 3 groups: cervical manipulation (n = 10), thoracic manipulation (n = 10), and nonmanipulation (control) (n = 10). Blood samples were extracted before, immediately after, and 2 hours after each intervention. Neurotensin, oxytocin, and orexin A were determined in plasma using enzyme-linked immuno assay. Cortisol was measured by microparticulate enzyme immuno assay in serum samples.

**Results** Immediately after the intervention, significantly higher values of neurotensin ( $P < .05$ ) and oxytocin ( $P < .001$ ) levels were observed with both cervical and thoracic manipulation, whereas cortisol concentration was increased only in the cervical manipulation group ( $P < .05$ ). No changes were detected for orexin A levels. Two hours after the intervention, no significant differences were observed in between-group analysis.

**Conclusion** The mechanical stimulus provided by spinal manipulation triggers an increase in neurotensin, oxytocin, and cortisol blood levels. Data suggest that the initial capability of the tissues to tolerate mechanical deformation affects the capacity of these tissues to produce an induction of neuropeptide expression.

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