

Increased forward head posture and restricted cervical range of motion in patients with carpal tunnel syndrome

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Abstract

Study design: Case control study.

Objectives: To compare the amount of forward head posture (FHP) and cervical range of motion between patients with moderate carpal tunnel syndrome (CTS) and healthy controls. We also sought to assess the relationships among FHP, cervical range of motion, and clinical variables related to the intensity and temporal profile of pain due to CTS.

Background: It is plausible that the cervical spine may be involved in patients with CTS. No studies have investigated the possible associations among FHP, cervical range of motion, and symptoms related to CTS.

Methods: FHP and cervical range of motion were assessed in 25 women with CTS and 25 matched healthy women. Side-view pictures were taken in both relaxed-sitting and standing positions to measure the craniovertebral angle. A CROM device was used to assess cervical range of motion. Posture and mobility measurements were performed by an experienced therapist blinded to the subjects' condition. Differences in cervical range of motion were examined using the nonparametric Mann-Whitney U test. A 2-way mixed-model analysis of variance (ANOVA) was used to evaluate differences in FHP between groups and positions.

Results: The ANOVA revealed significant differences between groups ($F = 30.4$; $P < .001$) and between positions ($F = 6.5$; $P < .01$) for FHP assessment. Patients with CTS had a smaller craniovertebral angle (greater FHP) than controls ($P < .001$) in both standing and

sitting. Additionally, patients with CTS showed decreased cervical range of motion in all directions when compared to controls ($P < .001$). Only cervical flexion ($r_s = -0.43$; $P = .02$) and lateral flexion contralateral to the side of the CTS ($r_s = -0.51$; $P = .01$) were associated with the reported lowest pain experienced in the preceding week. A positive association between FHP and cervical range of motion was identified in both groups: the smaller the craniovertebral angle (reflective of a greater FHP), the smaller the range of motion (r values between 0.27 and 0.45; $P < .05$). Finally, cervical range of motion and FHP were negatively associated with age in the control group but not in the group with CTS.

Conclusions: Patients with mild/moderate CTS exhibited a greater FHP and less cervical range of motion, as compared to healthy controls. Additionally, a greater FHP was associated with a reduction in cervical range of motion. However, a cause-and-effect relationship cannot be inferred from this study. Future research should investigate if FHP and restricted cervical range of motion is a consequence or a causative factor of CTS and related symptoms (eg, pain).