

Is forward head posture relevant to autonomic nervous system function and cervical sensorimotor control? Cross sectional study

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PMID: 31955048 | DOI: [10.1016/j.gaitpost.2020.01.004](https://doi.org/10.1016/j.gaitpost.2020.01.004)

Abstract

Background: There is a growing interest concerning the understanding of the sagittal configuration of the cervical spine as a clinical outcome. However, evaluating sensorimotor control and autonomic nervous system for participants with forward head posture (FHP) compared to strictly matched control participants with normal head alignment has not been adequately addressed.

Methods: Sensorimotor control variables include smooth pursuit neck torsion test (SPNT), Overall stability index (OSI) and left and right rotation repositioning accuracy. Autonomic nervous system function includes amplitude and latency of skin sympathetic response (SSR). We measured these variables in 80 participants with definite forward head posture (Craniovertebral angle less than 50 degrees) and 80 participants with age, gender, and BMI matched normal head alignment (Craniovertebral angle (CVA) more than 50 degrees). Differences in variable measures were examined using the parametric t-test. Pearson correlation was used to evaluate the relationship between FHP, sensorimotor control, and autonomic nervous system function.

Results: The unpaired t-test analysis showed that there were statistically significant differences between the FHP group and control group for all of the sensorimotor measured variables including SPNT, OSI and left and right rotation repositioning accuracy ($P < 0.001$). Also, there was a significant difference in neurophysiological findings, including SSR amplitude ($P = .005$), but there was no significant difference for SSR Latency ($P = .7$). The CVA significantly correlated with all measured variables ($P < 0.001$).

Conclusions: Participants with FHP exhibited abnormal sensorimotor control and autonomic nervous system dysfunction compared to those with normal head alignment.

Keywords: Autonomic nervous system; Cross sectional study; Forward head posture.

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