



The Correlations Between the Mechanical Properties of Masticatory Muscles and Cranio-Cervical Posture

Aurėja Daugėlaitė, Vilma Juodžbalienė 

Lithuanian Sports University, Kaunas, Lithuania

Background and Aim. Upper crossed syndrome (UCS) is associated with prolonged static posture, muscular imbalance, and postural dysfunction. Altered activation of cervical and scapular stabilising muscles may increase tension in the masticatory muscles and contribute to temporomandibular joint (TMJ) disorders, negatively affecting function and quality of life. However, the relationship between muscle tension and masticatory muscle function remains insufficiently investigated. This study aimed to investigate the correlation between the mechanical properties of the masticatory muscles and age, as well as the craniovertebral angle.

Methods. The study included 59 participants aged 18 to 52 years. Individuals who had completed orthodontic treatment within the past two years were excluded from participation. Myotonometry was used to assess the mechanical properties of the masticatory muscles. Craniovertebral posture was evaluated using the anthroposcopy and Kinovea software. Since age and craniovertebral angle were ordinal variables, Spearman's rank correlation was used.

Results. At baseline, the groups were homogeneous regarding age and craniovertebral angle. No significant association was found between the mechanical properties of the masticatory muscles and craniovertebral angle ($r = -0.053$, $p > 0.05$), whereas a significant positive association was observed with age ($r = 0.494$, $p < 0.001$).

Conclusions. The craniovertebral angle was not significantly associated with the mechanical properties of the masseter muscles. However, these mechanical properties demonstrated an age-related dependence. Considering that the prevalence of the upper crossed syndrome increases with age, it may be assumed that the mechanical properties of the masticatory muscles are indirectly related to the craniovertebral angle.

Keywords: Masticatory muscles; age; cranio-vertebral angle

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Informed Consent Statement: This study was approved by the Ethics Committee of Lithuanian Sports University (No. BNL-KIN (B)-2025-819, dated 03 11 2025). All participants provided written informed consent prior to participation. The study was conducted in accordance with the Declaration of Helsinki.

