ABSTRACT

**Background:** The forward head rounded shoulder (FHRS) sitting posture has been associated with decreased shoulder complex muscle strength and function. Upon clinical observation, the adverse effects of the FHRS sitting posture on shoulder complex isometric muscle strength is also present when testing controls for scapular position.

**Hypothesis/Purpose:** The purpose of the study was to assess the effect of various sitting postures on shoulder external rotator muscle isometric strength when the strength testing controls for scapular position.

**Study Design:** A cohort study, with subjects serving as their own controls.

**Methods:** One hundred subjects ages 20-26 participated in the study. Each subject was placed in a neutral cervical sitting (NCS) posture which was maintained for five minutes after which the strength of the dominant shoulder external rotators was immediately tested with the glenohumeral joint in the neutral position using a Micro-FET3 Hand Held Muscle Testing Dynamometer (HHMTD). Each subject was returned to the NCS posture for subsequent external rotator strength testing after five minutes in a FHRS sitting posture, five additional minutes in the NCS posture and five minutes in a retracted cervical sitting (RCS) posture resulting in each subjects' external rotator strength being tested on four occasions. Subjects were randomized for order between the FHRS and RCS postures.

**Results:** Mean strength values for each condition were normalized to the mean strength value for the 1st NCS condition for each subject. A statistically significant decline in shoulder external rotator strength following the FHRS sitting posture occurred compared to the appropriate postural conditions (p<.05). A frequency analysis revealed that 36% of the subjects demonstrated greater than 10% decline in external rotator strength following five minutes in the FHRS sitting posture. The average percentage of strength decline in those with greater than a 10% reduction in external rotator strength was 19%. Sixty-four percent of the subjects experienced less than a 10% decline in shoulder external rotator strength in response to the FHRS sitting posture.

**Conclusion:** Shoulder external rotator strength declined 8% following five minutes in the FHRS sitting posture. A sub-population of 36% demonstrated an average decline of 19% in shoulder external rotator strength following five minutes in the FHRS sitting posture. The strength decline appears to resolve over the short-term by returning to the NCS posture.

**Level of Evidence:** Level III

**Key Words:** Sitting posture, shoulder external rotator strength

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