RELIABILITY AND PRECISION OF MEASURING HUMERAL ROTATION RANGE OF MOTION WITH A GONIOMETER

Wassinger CA, Myers JB, Oyama S, Ricci RD, JollyJJ, Lephart SM
Neuromuscular Research Laboratory, University of Pittsburgh, Pittsburgh, PA

Limited humeral rotation range of motion (ROM) either contributing to or resulting from shoulder injury is a serious problem that can potentially hinder many activities of daily living. Clinicians and researchers alike need to effectively measure humeral ROM given the large impact restored ROM has on patients' progress and function. To date, few studies have assessed the reliability and precision of humeral rotation ROM using a goniometer. **PURPOSE:** To assess the reliability and precision of assessing humeral rotation ROM using a standard goniometry. **METHODS:** Measurements of humeral internal (IR) and external rotation (ER) were taken in 13 healthy subjects. Three trials of each motion were recorded simultaneously with a standard goniometer and an electromagnetic tracking device (ETD). Measurements were performed by two examiners with the subject in a supine position with 90^o of shoulder abduction and 90^o of elbow flexion. One examiner stabilized the scapula and moved the humerus while the other measured ROM with a goniometer. The examiners were blinded to the results of the ETD measurement. Intrasession reliability of the goniometric measurement was established by calculating intraclass correlation coefficients (ICC: 3,1). Goniometric precision was obtained by both calculating the absolute difference between the obtained goniometric and ETD measurements and by calculating the standard error of measurement (SEM) from the obtained intrasession goniometric reliability. ICC and SEM were also calculated between the goniometric measurement and the ETD (ICC: 1, 2). **RESULTS:** Correlation between the goniometer and the ETD was moderate for ER and good for IR (ICC= .728, SEM= .90 and ICC= .854, SEM= 1.02 respectively). Intrasession reliability and precision for the goniometric measurements was high for both IR (ICC= .985, SEM= 1.51) and ER (ICC= .942, SEM= 1.75) Absolute differences between goniometry and ETD for ER and IR were 2.60^o and 3.26^o, respectively. **CONCLUSIONS:** This study shows that goniometry is an effective way to measure humeral rotation ROM in healthy subjects. In comparison between goniometry and a highly precise ETD, clinicians can expect an error of approximately 3^o in humeral rotation.

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