Validity and reliability of the Myotest Pro wireless accelerometer

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British Journal of Sports Medicine Volume 44, Issue 14, 2010

Abstract

Assessing strength and power is crucial for evaluating muscular performance and function. As laboratory testing can be time-consuming or inaccessible to many athletes, portable accelerometers have been developed to assess strength and power on the field. Recently, a wireless accelerometer was introduced to allow for even greater flexibility in assessment. Nevertheless, any assessment tool must be valid and reliable. The aim of the current study was to assess the validity and reliability of a commercially available accelerometer. Forty-eight physically active subjects (males: n=32: age 30±9 years, height 1.79±0.12 m, body mass 82.0±14.3 kg; females: n=16: age 27±6 years, height 1.71±0.06 m, body mass 63.8±7.4 kg) completed two countermovement jump squats on a force plate (FP) with at least 1-min rest, on two separate occasions. The accelerometer was secured on a lightweight bar, which rested on the subjects' shoulders while jumping. The jump with the highest force generation was selected from each occasion for further analysis. Validity was determined from the Pearson correlation coefficient (r) between the accelerometer and the FP. Bias was also calculated, using a t test. Reliability was assessed by the intraclass correlation coefficient (ICC) and coefficient of variation (CV), while test-retest differences were examined with a t test. The accelerometer demonstrated significant and high correlation to the FP (p=0.001, r=0.85), while it overestimated force production by 7.8% (p=0.001). Repeatability for both devices was the same (ICC=0.87), with small CV (accelerometer=7.5%, FP=6.1%) and test-retest differences (accelerometer=0.1%, FP=1.1%). The results indicate that the Myotest Pro accelerometer is a valid and reliable tool for assessing force in the field. However, caution needs to be exercised when the results are compared to data obtained from a FP, as the Myotest Pro calculation method overestimates the maximum force produced.

http://dx.doi.org/10.1136/bjsm.2010.078972.59