FIGUR8

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Investigation of the Intra-Tester Reliability of sMMG Sensor Output

Quadriceps

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Purpose

This study evaluated the intra-tester reliability of lower extremity muscle bulk displacement measured by surface Mechanomyography (sMMG) sensors.

Methods

20 subjects (28.7 ± 9.1 years) participated in two testing sessions. In both sessions, sMMG sensors were placed bilaterally across the largest portion of the muscle bulk of the quadriceps. The same tester placed the sensors in both sessions. A total of 2 testers were used in this study. In each session, the subject performed three trials of a bilateral deep squat (BDS) activity (Figure 1).

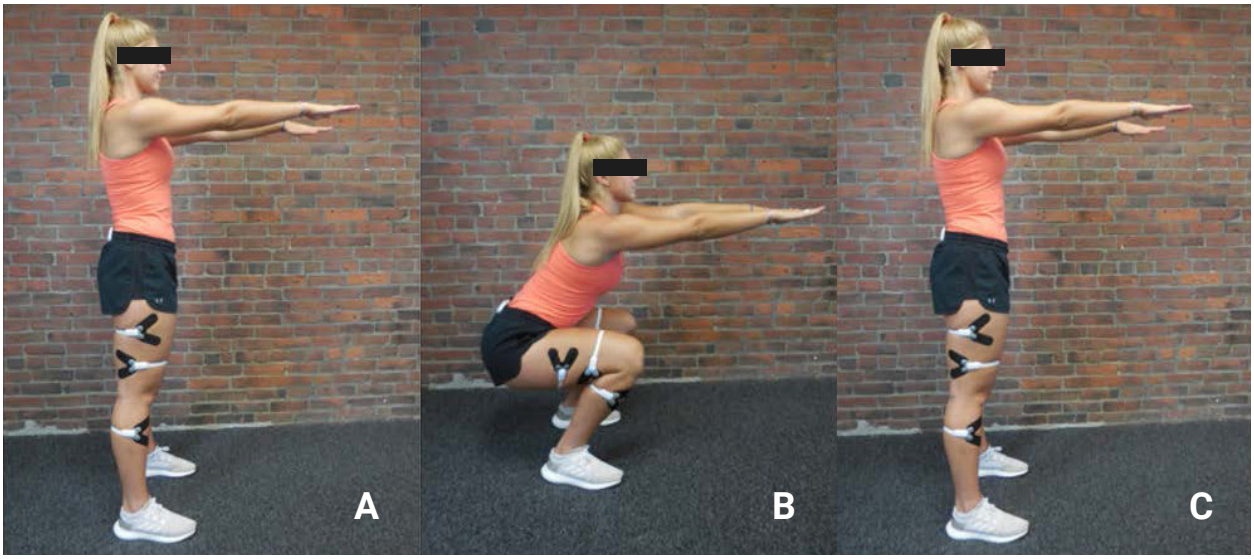

Figure 1. *Sagittal view of start (A) midpoint (B) and return to start (C) positions of the bilateral deep squat.*

Total muscle displacement was recorded for the quadriceps during the BDS activity. Data was extracted for analyses from the third trial performed during each testing session. If the third trial was not available, the second or fourth trial was used. Statistical analyses included ICC 2-way mixed effects consistency model evaluation of intra-tester reliability.

Results

Peak quadriceps (n= 20) muscle displacement displayed excellent correlation during intratester reliability testing.

$ICC_{3,1}$= 0.980 (0.948 - 0.992), p < .0001.

The average peak quadriceps muscle output during a squat activity with the same tester was 13.93 ± 9.94 mm for testing session 1 and 14.12 ± 10.25 mm for testing session 2.

Conclusions

The sMMG sensors demonstrated consistent detection of peak quadriceps muscle displacement with excellent intra-tester reliability for the magnitude of peak muscle displacement during the bilateral deep squat task.

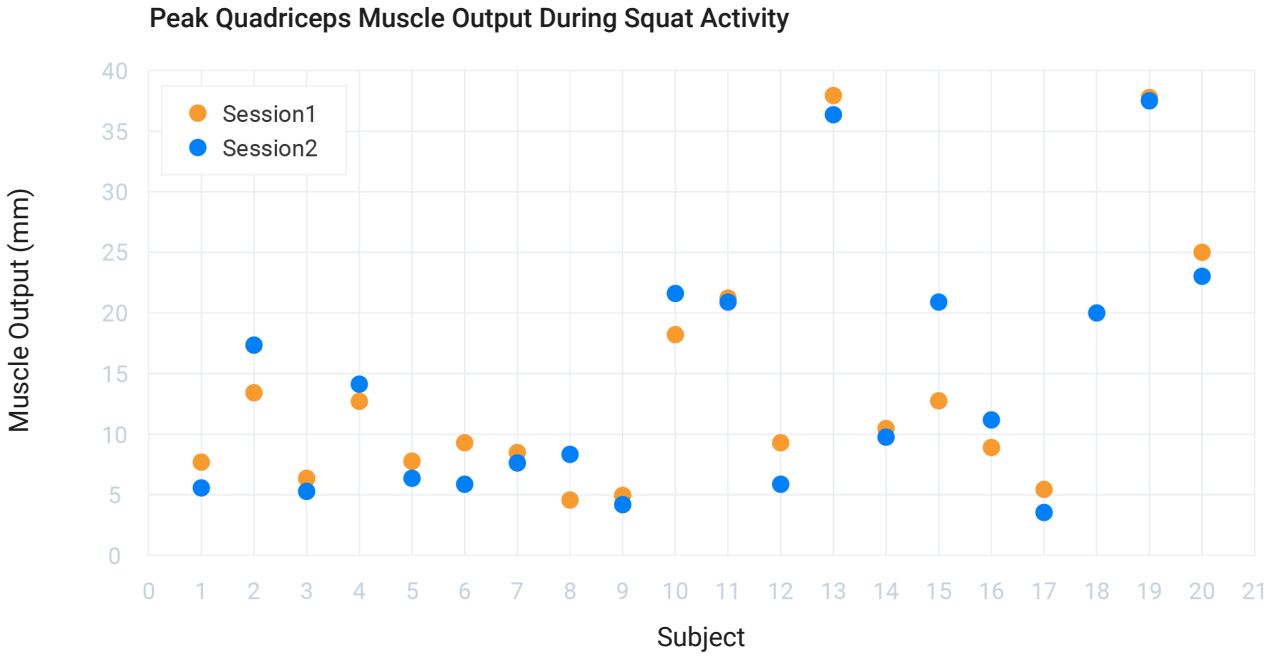

Figure 2. *Subjects' peak quadriceps muscle displacement during a squat activity across 2 testing sessions with the same tester.*

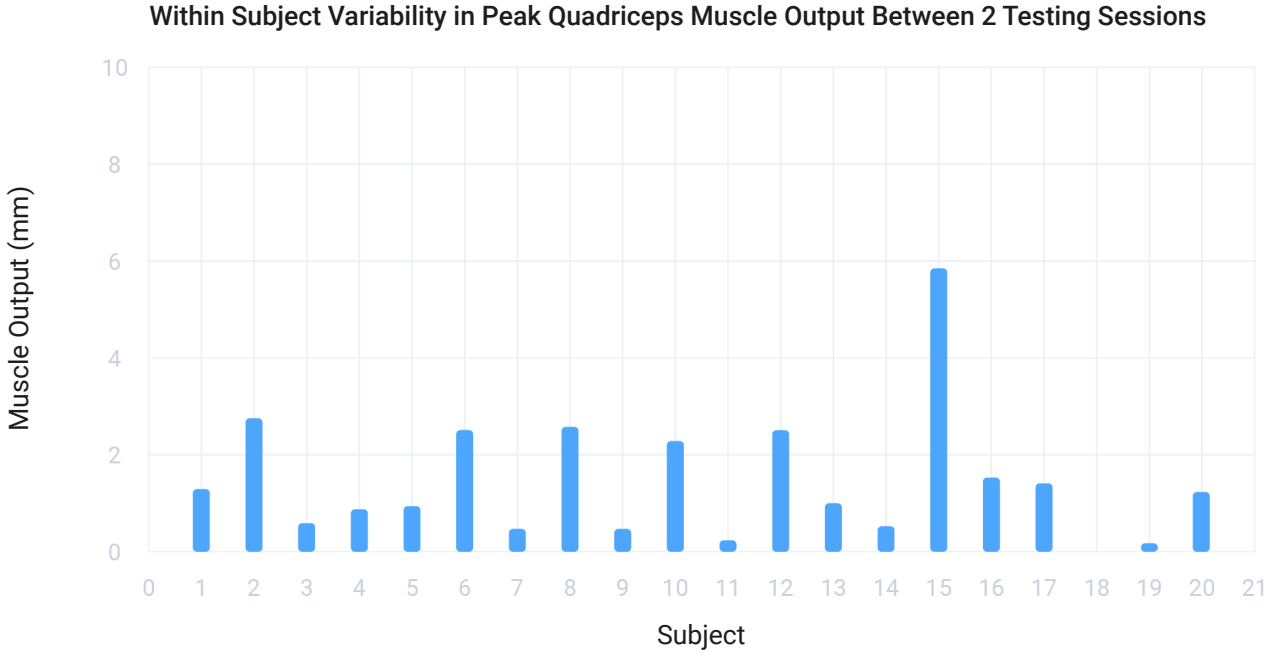

Figure 3. *Comparison of within-subject variability of peak quadriceps muscle displacement across 2 testing sessions with the same tester.*