The Influence of Familiarization Sessions on the Stability of Ramp and Ballistic Isometric Torque in Older Adults

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Ramp isometric contractions determine peak torque (PT) and neuromuscular activation (NA), and ballistic contractions can be used to evaluate rate of torque development (RTD) and electrical mechanical delay (EMD). The purposes of this study were to assess the number of sessions required to stabilize ramp and ballistic PT and to compare PT and NA between contractions in older adults. Thirty-five older men and women (age 63.7 ± 3.7 yr, body mass 64.3 ± 10.7 kg, height 159.2 ± 6.6 cm) performed 4 sessions of unilateral ramp and ballistic isometric knee extension, 48 hr apart. PT significantly increased (main time effect \( p < .05 \)) from the first to the third session, with no further improvements thereafter. There was a trend toward higher PT in ballistic than in ramp contractions. No difference between contraction types on EMG values was observed. Therefore, the authors suggest that 3 familiarization sessions be performed to correctly assess PT. In addition, PT, NA, RTD, and EMD can be assessed with ballistic contraction in older adults.

**Keywords:** muscle activation, EMG, knee extension

The increases in muscle strength after resistance-training programs have been directly related to improvements in quality of life and functional capacity in older adults (Fiatarone et al., 1990). However, the strength gains reported in the literature for this age group present a high variability (i.e., 27–226%), which reflects differences in training regimens and precision and type of the strength assessments (Fiatarone et al., 1990; Frontera, Meredith, O’Reilly, Knuttgen, & Evans, 1988; Hakkinen, Alen, Kallinen, Newton, & Kraemer, 2000).

Regarding the precision of strength assessments, learning how to perform a test seems to be critical to not overestimate the strength gains (Rydwik, Karlsson, Frandin, & Akner, 2007). Indeed, familiarization sessions have been used to minimize this learning effect and enable determination of the actual strength improvements resulting from resistance training (Frontera et al., 1988). For instance, Ploutz-Snyder and Giamis (2001) reported that untrained older men need eight