Effects of Age and Sex on Muscle Function during Isovelocity Contractions.
Cortney N. Steele, Andrea J. Fradkin, FACSM, Joseph L. Andreacci, FACSM, Andrew C. Veneziaz
Eric S. Rawson, FACSM.
Bloomsburg University, Bloomsburg PA

PURPOSE: To assess the effect of age and sex on absolute and relative knee extensor peak torque (PT),
power (PW), and time to peak torque (TTP) at multiple velocities. METHODS: 61 women and 87 men
completed 3 maximal knee extensions at 60, 120, and 180°/sec on an isokinetic dynamometer. Data were
analyzed as absolute values and relative to FFM. Volunteers were grouped by sex and age (YW=young
women (20 yr); YM=young men (21 yr); OW=old women (71 yr); OM=old men (73 yr)). FFM was
estimated with bio-impedance. ANOVAs were conducted to locate differences between groups.
RESULTS: Absolute and relative PT (60 °/s) were different between sex (absolute PT: YM=236.3 vs.
YW=148.8; OM=137.2 vs. OW=85.4 Nm) and age groups (YW>OW; YM>OM). Absolute and relative
PT (120 °/s) were different between sex (absolute PT: YM=155.8 vs. YW=97.5; OM=90.7 vs. OW=56.1 Nm) and age groups
(YW>OW; YM>OM). Absolute and relative PT (180 °/s) were different
between sex (absolute PT: YM=157.6 vs. YW=101.2; OM=91.1 vs. OW=57.4 W) and age groups (YW>OW; YM>OM). Absolute
and relative PW (60 °/s) were different between sex (absolute PW:
YM=157.6 vs. YW=101.2; OM=91.1 vs. OW=57.4 W) and age groups (YW>OW; YM>OM). Absolute
and relative PW (120 °/s) were different between sex (absolute PW:
YM=256.3 vs. YW=159.9; OM=150.2 vs. OW=89.2 W) and age groups (YW>OW; YM>OM). Absolute and relative PW (180 °/s)
were different between sex (absolute PW: YM=311.2 vs. YW=189.2; OM=171.7 vs. OW=102.5 W) and age groups (YW>OW; YM>OM). Absolute TTP (60 °/s) was not different between sex (absolute TTP:
YM=0.27 vs. YW=0.37; OM=0.31 vs. OW=0.27 s) and age groups. Relative TTP was different between sex
(YM=0.004 vs. YW=0.006; OM=0.005 vs. OW=0.007 s) but not age groups. Absolute TTP (120 °/s)
was not different between sex (absolute TTP: YM=0.18 vs. YW=0.21; OM=0.18 vs. OW=0.19 s) and age
groups. Relative TTP was different between sex (YM=0.0008 vs. YW=0.001; OM=0.004 vs. OW=0.004
s) but not age groups. Absolute TTP (180 °/s) was not different between sex (absolute TTP: YM=0.13 vs.
YW=0.13; OM=0.11 vs. OW=0.13 s) and age groups. Relative TTP was different between sex
(YM=0.002 vs. YW=0.003; OM=0.002 vs. OW=0.003 s) but not age groups. CONCLUSION: Older
adults had reduced absolute and relative PT and PW compared to young adults. YM had faster relative
TTP than YW; and OM had faster relative TTP than OW.
Supported by NIH National Center for Complementary and Alternative Medicine (1R15 AT003938-01)
and the Bloomsburg University Foundation.