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Effects of Glutathione Depletion on Real-Time Muscle Performance during a Chronic Exposure of Stretch-Shortening Contractions: Age Effects: 1364: *Board #103* May 28 9:30 AM - 11:00 AM

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The effect of glutathione depletion on the ability of skeletal muscle to adapt to a chronic exposure of high-intensity mechanical loading is not known.

PURPOSE: To investigate if age and glutathione depletion affects the change in realtime mechanical response of skeletal muscle during a chronic administration of stretchshortening cycles (SSCs).

METHODS: The left dorsiflexor muscles of young (3 mo age, N = 16) and old (30 mo age, N = 16) vehicle- and BSO-treated male Fischer 344 x Brown Norway rats were exposed 3x/week for 4.5 weeks to a protocol of 8 sets of 10 maximum SSCs per exposure in vivo. Both the eccentric and concentric components of the SSCs were conducted at an angular velocity of 60 deg/s. Changes in real-time performance during each exposure were quantified and it was determined that sets 1, 3, 5 and 8 could accurately represent the changes in mechanical behavior during the protocol. From the force and position data, peak force, minimum force, negative work and positive work, were quantified for the first oscillation in each set to determine changes between sets. These force and work values were calculated for all 14 exposure sessions.

RESULTS: The peak force ($p < 0.0001$), negative work ($p < 0.0001$), and positive work ($p < 0.0001$) increased significantly in the young group over the 4.5 week protocol, whereas the old age group showed a decreasing trend. There was a significant interaction of BSO supplementation and age on the response of peak force ($p = 0.004$), minimum force ($p = 0.033$), negative work ($p = 0.001$), and positive work ($p = 0.002$) throughout the exposure period.

CONCLUSIONS: Age negatively affected the real-time dynamic performance measures during the chronic exposure. Glutathione depletion also affected the old animals more than the young animals in terms of deficits in dynamic performance measures during the chronic exposure.

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