



POOR RECOVERY OF MUSCLE FUNCTION BUT NOT MUSCLE VOLUME AFTER TEN DAYS OF BED REST IN OLDER INDIVIDUALS WITH PRE-DIABETES OR TYPE 2 DIABETES

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Older adults with pre-diabetes (p-D) or type 2 diabetes (T2D) may be vulnerable to an accelerated loss of muscle mass and function¹ due to poor recovery following physical inactivity (1,2,3). To test this paradigm, we conducted a 10-day bed rest study to characterize the recovery of muscle volume and function in older adults with p-D or T2D. Thirty-nine older adults with p-D or T2D (p-D/T2D 14M/13F, 65 ± 5.0 y) or who were metabolically healthy (CON, 6M/6F, 68 ± 2.9 y) completed a 10-day bed rest intervention, followed by 4 weeks of ambulatory recovery. Mid- thigh muscle volume was assessed by MRI. Knee extensor power and torque were determined by isokinetic dynamometry. Free living activity was quantified via actigraphy. Mitochondrial oxidative phosphorylation capacity (ATPmax) was assessed by ³¹P-MRS. All assessments were completed pre- and post-bed rest, and weekly during recovery with analyses performed via repeated measures ANCOVA controlling for baseline. Bed rest de-

creased muscle volume similarly between groups (~2.3%), with volume returning to baseline levels after only 1 week of ambulatory recovery. However, knee extensor power (CON: 115.8 ± 41.6 vs p-D/T2D: 99.0 ± 43.1 watts, P<0.05) and torque (CON: 87.6 ± 26.6 vs p-D/T2D: 78.0 ± 30.6 N*m, P<0.05) remained significantly lower in the p-D/T2D group during ambulatory recovery. Physical activity levels returned to baseline after 1 week of ambulatory recovery for both groups. ATPmax decreased (~11.5%) and failed to return to baseline in both groups. Older adults with pre-diabetes/T2D had delayed recovery of muscle function after bed rest, despite recovery of muscle volume. Muscle mitochondrial energetics did not recover during ambulatory recovery for both groups. These data suggest that older adults with pre-diabetes or type 2 diabetes are uniquely vulnerable to inactivity induced muscle dysfunction and may require a targeted rehabilitation strategy to facilitate recovery of muscle function.

Keywords: *bed Rest, older adult, diabetes, muscle.*