

Δ Significant Loss of Skeletal Muscle Mass Occurs After Femoral Fragility Fracture

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Purpose: Femoral fragility fractures in the elderly result in devastating loss of physical function and muscle mass, which is a direct result of immobilization and nutrition deficiencies during the healing phase after trauma. A better understanding of how muscle mass responds to injury is needed to critically evaluate nutrition and rehabilitation interventions designed to prevent muscle loss and optimize function. The purpose of this study was to document sarcopenia, nutrition status, and changes in muscle mass after femoral fragility fractures.

Methods: A 2-center prospective observational study enrolled individuals ≥ 65 years old admitted for operative fixation of a low-energy femoral fracture. Body composition was assessed within 72 hours of admission (baseline) using multifrequency bioelectrical impedance and repeated 6 and 12 weeks after injury. Sarcopenia was defined by gender-specific cutoffs for the appendicular skeletal muscle mass index. Malnutrition was defined by Mini Nutritional Assessment. Wilcoxon signed rank test was used to assess 6 and 12-week change from baseline in lean body mass (LBM) and skeletal muscle mass (SMM). Wilcoxon rank sum test was used to compare the change in body composition in those with versus without malnutrition and sarcopenia. LBM and SMM results are presented as median (interquartile range).

Results: 30 participants (27% male) age 76.9 ± 8.9 years were enrolled. At baseline, 11 (37%) were sarcopenic, and 17 (59%) had malnutrition. LBM and SMM decreased 2.81 kg (-6.03 to -0.3), $P < 0.001$) and 1.75 kg (-3.30 to -0.40), $P < 0.001$) by 6 weeks post-injury, respectively. By 12 weeks, participants lost 5.19 kg of LBM (-7.94 to -2.15), $P < 0.001$) and 3.04 kg of SMM (-4.49 to -1.45), $P < 0.001$). Participants with adequate baseline nutrition status lost more LBM at 6 weeks compared to those with malnutrition (-6.32 kg [-8.26 to -1.85] vs -2.31 kg [-3.50 to -0.20], $P = 0.042$). While no difference was observed in LBM loss between those with versus without sarcopenia, sarcopenia prevalence increased 22% by 12 weeks after injury.

Conclusion: Femoral fragility fractures result in devastating losses of lean body mass and skeletal muscle mass. Most were classified as malnourished, but participants with adequate baseline nutrition lost more muscle mass, indicating that future investigations of interventions to prevent muscle loss should focus on all fragility fracture patients regardless of nutrition status. These results highlight the need for further investigation into interventions to mitigate muscle loss after injury.

Δ OTA Grant

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device they wish to use in clinical practice.