Δ Core Muscle Heterogeneity and Sarcopenia: A Marker for Frailty and Increased Complications in Orthopaedic Trauma Patients

Marijke Julia DeVos, MD[1]; Robert P. Runner, MD[2]; Catphuong Le Vu, MD MPH[3];
Monica B. Umpierrez, MD[2]; Kiarash Jahed, MD[2]; Adam Daniel Singer, MD[2];
Mara Schenker, MD[2]
[1]*UT Houston, Houston, Texas, USA*
[2]*Emory University, Atlanta, Georgia, USA*
[3]*University of Washington, Norcross, Georgia, USA*

Purpose: Frailty indices are promising composite measures reflecting frailty, an age-related decrease in physiologic reserve, that can be used for patient risk stratification and interdisciplinary intervention. Sarcopenia, a radiographic measure of diminished core muscle mass, is a proxy for the Modified Frailty Index (MFI). The purpose of this study was to examine sarcopenia in orthopaedic trauma patients, to define an appropriate assessment tool in the setting of traumatic injury, and to evaluate the association with frailty scores and complications.

Methods: The institutional trauma database was queried for lower extremity fracture diagnosis codes from 2012 to 2015. The MFI was calculated for each patient identified. Frailty was defined by an MFI of 0.27 and greater. The total psoas cross-sectional area (TPA, cm^2), the mean Hounsfield Units (HU), the standard deviation of HU, and the Goutallier Classification were measured from CT scans of the abdomen and pelvis obtained at the time of injury. Several measures—TPA, mean HU, TPA × HU, TPA × body mass index (BMI), and TPA × HU × BMI—were used to radiographically classify patients. The lowest quartile for each sex for each measure was designated sarcopenic. Complications were compared between the frail and robust patients and between the sarcopenic and non-sarcopenic patients.

Results: 103 patients were identified as robust and 20 patients were frail. Frail patients experienced increased complications compared to robust patients (P = 0.03). Age was not predictive of postoperative complications (P = 0.27). Of the radiographic measures analyzed, only myosteatosis, as measured by mean HU, was predictive of increased complications in the sarcopenic group (P ≤0.01).

Conclusion: Frailty is a predictor of postoperative complications in orthopaedic trauma patients. Psoas cross-sectional area did not predict frailty or complications; however, myosteatosis, as determined by a lower mean attenuation value of the psoas muscle on CT, was predictive of a higher rate of post-surgical complications in comparison to patients with higher attenuation values.

POSTER ABSTRACTS