Paper #40

Modified Frailty Index is an Effective Risk Assessment Tool in Primary Total Knee Arthroplasty

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Introduction: "Frailty" is a marker of physiologic decline of multiple organ systems and the frailty index identifies patients who are more susceptible to post-operative complications. The purpose of this study is to validate the modified frailty index as a predictor of postoperative complications, reoperations, and readmissions in patients who underwent primary total knee arthroplasty (TKA).

Methods: The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database from 2005-2014 was queried by the Current Procedural Terminology (CPT) code for primary TKA (27447). A previously described modified frailty index (MFI) was utilized to summate 11 variables in five organ systems. Bivariate analysis was performed for post-operative complications (all occurrence of adverse events, infection, cardiac, pulmonary, renal, hematologic, adverse discharge disposition, hospital length of stay, reoperation, and readmission). A multiple logistic regression model was used to determine the relationship between MFI, American Society of Anesthesiologists (ASA) score and 30-day reoperation, controlling for age, gender, and BMI.

Results: 90,566 patients underwent primary TKA during the study period. As MFI score increased, 30-day mortality significantly increased (p<0.001). Additionally, significantly higher rates of all post-operative complications (all p<0.001) were observed with increasing MFI including: infection, wound, cardiac, pulmonary, renal, hematologic, any occurrence. More frail patients also had increasing odds of adverse hospital discharge disposition, reoperation, and readmission (all p<0.001). Length of hospital stay increased from 3.10 days to 5.16 days (p<0.001) while length of ICU stay increased from 3.47 days to 5.07 days (p<0.001) between MFI score 0 and 0.36+. MFI predicts 30-day reoperation with an adjusted odds ratio of 3.32 (95% CI: 1.36-8.11, p<0.001). Comparatively, MFI was a stronger predictor of reoperation compared to ASA score and age with adjustment for gender and BMI.

Conclusions: Utilization of the modified frailty index is a valid method in predicting postoperative complications, reoperations, and readmissions in patients undergoing primary TKA and can provide an effective and robust risk assessment tool to appropriately counsel patients and aid in preoperative optimization.

