The 8-item Modified Frailty Index As A Risk Assessment Tool for Patients Undergoing Anterior Cervical Discectomy and Fusion

Rishi Gonuguntla, David A Momtaz, Gautham Prabhakar, Farhan Ahmad, Travis Mark Kotzur, Sarah Catherine Nagel, Kadin Ahmad, Christopher D Chaput[1]
[1]UT Health San Antonio

INTRODUCTION: Anterior cervical discectomy and fusion (ACDF) is a common procedure for cervical disease, typically alleviating pain and improving function. Appropriate patient selection and risk stratification are imperative. The modified frailty index (MFI) uses preoperative risk factors to predict postoperative complications after orthopaedic procedures. We hypothesized that this index would predict complications in a large cohort of ACDF patients.

METHODS: We reviewed the American College of Surgeons-National Surgical Quality Improvement Program (ACS-NSQIP) database, including patients who underwent ACDF from 2015 to 2020. We calculated an unweighted 8-item MFI score consisting of morbid obesity (BMI >35), osteoporosis, congestive heart failure, hypoalbuminemia (<3.5), hypertension, chronic obstructive pulmonary disease (COPD), diabetes mellitus, and non-independent functional status for each patient. We recorded 30-day postoperative complications, readmission, and reoperation rates, adjusting for baseline features using standard multivariate regression.

RESULTS: We identified 17,662 ACDF cases. Patients with an MFI of 5 or greater had 37.53 times increased odds of incurring postoperative complications than patients with an MFI of 0 ($p<0.001$) after controlling for age, sex, race, and ethnicity. Specifically, life-threatening Clavien-Dindo IV complications and wound, cardiac, renal, and pulmonary complications were significantly increased in patients with an MFI of 5 or greater. Also, as MFI scores increased from 1 to 5 or greater, the odds of readmission increased from 1.36 to 5.42 ($p<0.001$) and the odds of reoperation from 1.19 ($p=.185$) to 6.54 ($p<0.001$). Frailty was still associated with increased complications, readmission, and reoperation after controlling for demographic data, operative time, and length of stay.

DISCUSSION AND CONCLUSION: Frailty is highly predictive of postoperative complications, readmission, and reoperation following ACDF. A simple frailty evaluation could guide surgical decision-making and patient counseling for cervical disease.