Grip Weakness Increases 30-day Readmission for Patients with Acute Exacerbation of COPD

Authors: Alex Spacht, Leah J. Witt, MD, Ashley Hull, Daniel Chang, Nicole M. Twu, MS, Zulema D. Iboa Garcia, Elizabeth Donnelly, Chelsea Stratton, Kyle Carey, Ann E. Arcese, APN, Vineet M. Arora, MD, MAPP, Steven R. White, MD, Megan Huisingh-Scheetz, MD, MPH, and Valerie G. Press, MD, MPH

Background: Chronic obstructive pulmonary disease (COPD) is the third leading cause of death and hospitalization in the US and affects approximately 12% of Medicare beneficiaries. Over 20% of patients hospitalized for acute exacerbations of COPD (AECOPDs) are readmitted within 30 days of discharge. Lowering readmission rates is a specific target of the Centers for Medicare and Medicaid Services; new penalties are being imposed on hospitals with high rates of readmission. Frailty, a multidimensional clinical syndrome that describes increased vulnerability to acute stressors, is associated with higher rates of hospitalization. Frailty is prevalent in approximately 58% of COPD patients over 55 years. In-hospital prevalence of frailty in patients with AECOPD and its linkage to readmission risk, is not yet known. The objective of this study is to identify whether frailty or components of the frailty assessment (proxy measures such as grip strength or gait speed) predict 30-day readmission in patients following AECOPD admission.

Methods: From July 2016 to March of 2017, we prospectively identified patients admitted with AECOPD. Consenting eligible patients underwent study assessments that included COPD symptoms (Borg, mMRC) and the Fried Frailty Criteria (grip strength, 15-foot gait speed, level of exhaustion, physical activity, and unintentional weight loss). Categorical variables are reported as proportions and continuous variables are reported as medians with interquartile ranges (IQR). T-test and chi square tests were used to analyze unadjusted participant characteristics. Multivariate logistic regression models were used to assess the odds of frailty variables, with adjusted models accounting for age and sex. We report the odds ratios (OR) and 95% confidence intervals (CI).

Results: Fifty-three consenting participants completed some or all assessments, the majority were African American (94%), female (53%), and with a median age of 64 years (IQR 55-71). The readmission rate for patients categorized as frail was 28.1%, while only 11% of non-frail/pre-frail patients were readmitted. Weak grip strength was strongly predictive of readmission (adjusted (sex, BMI) OR 25.8, 95% CI 2.2, 303.5, p=0.01). Aggregated frailty score, median 15-feet gait speed did not predict readmission (adjusted p=0.09 and p=0.6 respectively).

Conclusion: In a cohort of patients admitted with AECOPD, weak grip is predictive of all-cause readmission at 30 days. This relationship suggests that physical performance measures such as grip strength could be used to stratify patients with
respect to risk of readmission, allowing for targeted clinical intervention for high-risk patients to prevent hospitalizations and readmissions.