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Frailty predicts hospital acquired infections after brain tumor resection: Analysis of 27,947 patients' data from a prospective multicenter surgical registry

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Abstract

Background: Hospital acquired infections (HAIs) present a significant source of economic burden in the United States. The role of frailty as a predictor of HAIs has not been illustrated among patients undergoing craniotomy for brain tumor resection (BTR).

Methods: The American College of Surgery National Surgical Quality Improvement Program (ACS-NSQIP) database was queried from 2015 to 2019 to identify patients who underwent craniotomy for BTR. Patients were categorized as pre-frail, frail and severely frail using the 5-factor Modified Frailty Index (mFI-5). Demographics, clinical and laboratory parameters, and HAIs were assessed. A multivariate logistic regression model was created to predict the occurrence of HAIs using these variables.

Results: A total of 27,947 patients were assessed. 1772 (6.3 %) of these patients developed an HAI after surgery. Severely frail patients were more likely to develop an HAI in comparison to pre-frail patients (OR = 2.48, 95 % CI = 1.65-3.74, $p < 0.001$ vs. OR = 1.43, 95 % CI = 1.18-1.72, $p < 0.001$). Ventilator dependence was the strongest predictor of developing an HAI (OR = 2.96, 95 % CI = 1.86-4.71, $p < 0.001$).

Conclusion: Baseline frailty, by virtue of its ability to predict HAIs, should be utilized in adopting measures to reduce the incidence of HAIs.

Keywords: Brain tumors; Frailty; Modified frailty index (mFI-5); National Surgical Quality Improvement Program (NSQIP); Surgical outcomes.