Surgery in patients with infective endocarditis and prognostic importance of patient frailty

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Background/Introduction: Patients with infective endocarditis have a poor one-year prognosis with a high risk of death or rehospitalizations within the first year after discharge. Surgery remains a cornerstone in the treatment of infective endocarditis but might be futile in frail patients with limited life expectancy; however, knowledge on surgical outcomes across frailty remains sparse.

Purpose: To characterize patients with IE according to frailty and how frailty modifies prognosis among those who undergo surgery.

Methods: We identified all first-time admissions for IE who underwent surgery during admission in Denmark (2010-2020). All patients were categorized according to frailty (low or intermediate/high frailty) using the validated Hospital Frailty Risk Score based on the ICD-10 diagnosis codes. Hospitalization was defined as the cumulative admission length reported by frailty. In survival analysis, patients were followed from IE discharge until death, 14 days of hospitalization, December 31 (2021), or one year after IE discharge, whichever came first. The 1-Kaplan-Meier estimator was used to estimate the unadjusted probabilities of hospitalization or death by frailty. Furthermore, multivariate Cox proportional hazards model regression was used to assess the association of frailty with the combined outcome of death or rehospitalization of ≥14 days. We adjusted for the following risk factors not included in the Hospital Frailty Risk Score: age, sex, microbiological etiology, hypertension, diabetes, chronic kidney disease, and dialysis.

Results: We identified 6,290 patients with first-time IE, of whom 1,282 (20.4%) underwent surgery. Among the patients who underwent surgery, 967 (75.4%) were categorized as having low frailty and 315 (24.6%) as intermediate/high frailty. Intermediate/high frail patients were older (67 vs. 64 years) and had a lower proportion of males (71.7% vs. 79.9%). Intermediate/high frail patients who underwent surgery were more often hospitalized for ≥14 days (19.1% vs. 12.3%) or died during the first year from IE discharge (11.7% vs. 6.2%) than low frail patients. Intermediate/high-frail patients were associated with an increased one-year probability of both the combined outcome of rehospitalization ≥14 days or death (31.5% [25.6%-37.0%] vs. 19.3% [16.7%-21.9%], Figure 1A) and death (11.7% [7.7%-15.5%] vs. 6.1% [4.5%-7.7%], Figure 1B) compared with low frail patients. In the adjusted analysis, intermediate/high frail patients were associated with an increased rate of rehospitalization ≥14 days or death (HR 1.39 [1.04-1.85]) as compared with low frail patients.

Conclusion: Intermediate/high frail patients were older and were associated with an increased rate of rehospitalizations ≥14 days or death. Frailty is a key patient feature in patient assessment and surgical treatment and more studies are needed to assess effectiveness of surgery by frailty to avoid futile surgeries.

Risk of rehospitalization or death one year from IE discharge

A: Rehospitalization (≥14 days) or death

B: Death

Figure 1: Rehospitalization or death