
Congestive Heart Failure and Noncardiac Operations: Risk of Serious Morbidity, Readmission, Reoperation, and Mortality



Florence E Turrentine, PhD, RN, Min-Woong Sohn, PhD, Rayford Scott Jones, MD, FACS

BACKGROUND: Congestive heart failure (CHF) predicts surgical morbidity and mortality. However, few studies evaluate CHF's impact on noncardiac operations. Because of CHF's serious threat to health and survival, surgeons must understand risks CHF poses to patients undergoing a diverse array of operations.

STUDY DESIGN: We used 2009 to 2013 American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Participant Use Files to estimate the risk of serious morbidity, reoperation, readmission, mortality, and other postoperative complications associated with preoperative diagnosis of CHF. Multivariable logistic regression analysis provided odds ratios (OR) and 95% confidence intervals (CI) for outcomes in 34 ACS NSQIP procedure groups, controlling for age, sex, race, emergency surgery status, American Society of Anesthesiologists Classification, body mass index, and selected laboratory values.

RESULTS: Unadjusted ORs indicate adverse effects of CHF on surgical outcomes for most procedures considered. When adjusted for age and other confounders, CHF persists with adverse effects on most outcomes, including serious morbidity (OR 1.52, 95% CI, 1.44 to 1.61; $p < 0.001$); reoperation (OR 1.29, 95% CI, 1.17 to 1.42; $p < 0.001$); readmission (OR 1.39, 95% CI, 1.29 to 1.50; $p < 0.001$); and 30-day mortality (OR 1.96, 95% CI 1.80 to 2.13; $p < 0.001$). The impact of CHF on morbidity and mortality substantially affected those undergoing carotid endarterectomy and lower extremity endovascular repair. Cardiac arrest, mortality, unplanned intubation, and ventilator > 48 hours were complications most affected by CHF.

CONCLUSIONS: Congestive heart failure strongly predicts serious morbidity, unplanned reoperation, readmission, and surgical mortality for noncardiac operations. Surgeons must pay particular attention to recognizing CHF and optimizing perioperative management when considering surgery. (J Am Coll Surg 2016;222:1220–1229. © 2016 by the American College of Surgeons. Published by Elsevier Inc. All rights reserved.)

Congestive heart failure (CHF), a cause of morbidity and mortality after noncardiac surgery,¹ predicts mortality for Medicare beneficiaries^{2,3} and for patients undergoing a range of operations, from outpatient laparoscopic cholecystectomy⁴

to pancreaticoduodenectomy for cancer.⁵ Even though CHF increases the risk of a variety of surgical complications^{2,3,6} including postoperative delirium⁷ and anastomotic leaks,⁸ there is no systematic examination of the kinds of noncardiac operations and adverse outcomes it affects. In this study, we conducted a comprehensive analysis of the impact of CHF on serious morbidity, reoperation, readmission, mortality, and other postoperative complications for an extensive array of surgical procedures. Undergoing surgery with the comorbidity of CHF should alert clinicians to increased risk that may be mitigated through preoperative counseling and vigilant perioperative management.

Disclosure Information: Nothing to disclose.

Disclaimer: American College of Surgeons (ACS) NSQIP and the hospitals participating in the ACS NSQIP are the source of the data used herein; they have not verified and are not responsible for the statistical validity of the data analysis or the conclusions derived by the authors.

Presented at the American College of Surgeons 101st Annual Clinical Congress, Chicago, IL, October 2015.

Received December 8, 2015; Revised February 2, 2016; Accepted February 29, 2016.

From the Departments of Surgery (Turrentine, Jones) and Public Health Sciences (Sohn), University of Virginia, Charlottesville, VA.

Correspondence address: Rayford Scott Jones, MD, FACS, Department of Surgery, University of Virginia, Box 800709, Charlottesville, VA 22908. email: rsj@virginia.edu

METHODS

We used the 2009 through 2013 American College of Surgeons National Quality Improvement Program

(ACS NSQIP) Participant Use Files (PUF)⁹ to identify patients with CHF undergoing surgery. The PUF is an approved Public Data Set at the University of Virginia, so no additional institutional review or approval was required.

The ACS NSQIP CHF variable includes patients with a new diagnosis of CHF or a recent exacerbation of chronic CHF. The ACS NSQIP defines CHF as “the inability of the heart to pump a sufficient quantity of blood to meet the metabolic needs of the body or a situation where the heart can do so only at increased ventricular filling pressure.” Common CHF manifestations include exercise intolerance due to dyspnea or fatigue; orthopnea; paroxysmal nocturnal dyspnea; increased jugular venous pressure; pulmonary rales; cardiomegaly; pulmonary vascular engorgement; and pulmonary edema. To meet ACS NSQIP criteria, CHF must be newly diagnosed, or a diagnosis of chronic CHF requires current signs or symptoms in the 30 days before the principal operation.¹⁰

We grouped operations into 34 targeted procedure categories as outlined by the ACS NSQIP.¹¹ Congestive heart failure occurred rarely for many of these procedures. Therefore, we excluded groups with 30 or fewer patients with CHF or <0.5% of the total procedure volume from further analyses. These groups included hepatectomy, esophagectomy, carotid artery stenting, gynecologic reconstruction, bladder suspension, prostatectomy, cystectomy, breast reduction, breast reconstruction, and abdominoplasty.

We used the ACS NSQIP definition of serious morbidity, which includes 1 or more of the following occurrences: cardiac arrest, myocardial infarction, pneumonia, progressive renal insufficiency, acute renal failure, venous thromboembolism, return to the operating room, deep incisional surgical site infection, organ space surgical site infection, systemic sepsis (sepsis or septic shock), unplanned intubation, urinary tract infection, or wound disruption. When present at the time of surgery, superficial, deep, and organ space surgical site infection, pneumonia, unplanned intubation, sepsis, progressive renal insufficiency, acute renal failure, and urinary tract infection were not considered as postoperative complications.¹²

Renal failure and dialysis were combined into 1 variable to indicate presence of chronic kidney disease. A priori we included independent variables, age, sex, ethnicity, emergent status, functional status, American Society of Anesthesiologists (ASA) classification, BMI, dyspnea, renal dysfunction, and laboratory values serum glutamic oxaloacetic transaminase (SGOT), blood urea nitrogen (BUN), creatinine, and international normalized ratio (INR).

Study outcomes included serious morbidity, readmission, reoperation, and mortality within 30 days of discharge. We analyzed these outcomes together as well as separately for each of the 34 ACS NSQIP targeted procedure groups using multivariable logistic regression. In adjusted models, we controlled for the following potential confounders: age, sex, race, emergency surgery status, ASA score (3, 4, 5 vs 1 or 2), BMI, and selected preoperative laboratory values. Sensitivity analyses evaluated how and whether the addition of preoperative cardiac variables (previous percutaneous coronary intervention, history of myocardial infarction, previous cardiac surgery, history of angina, revascularization for peripheral vascular disease) diminished the magnitude of association between CHF and study outcomes. We also included operative duration and outpatient surgery status as 2 other measures of patient severity in our sensitivity analysis models. Stata SE version 13 (Statacorp) was used to conduct the analysis.

RESULTS

Of 2.3 million records in the 2009 through 2013 ACS NSQIP PUFs, we used data for 1,268,999 patients who met our inclusion criteria. Only 0.61% of patients who underwent surgery met the ACS NSQIP definition of CHF, with the highest rates occurring in patients having surgery for carotid artery stenting, hip fracture repair, and lower extremity endovascular revascularization, 3.59%, 3.27%, and 2.97%, respectively (Table 1). Patients undergoing breast reconstruction, breast reduction, and gynecologic reconstruction presented with the fewest cases of CHF: 0.02%, 0.04%, and 0.04%, respectively.

Table 2 shows characteristics of patients who met inclusion criteria and presented with and without CHF (n = 1,174,002). Patients were significantly different on all characteristics, with age and race/ethnicity being the most prominent characteristics that distinguished patients with CHF from those without the comorbid condition. Congestive heart failure increased exponentially with increasing age; of the patients with CHF, 46.54% were 75 years of age or older compared with 14.76% of those without CHF (p < 0.001). Thirteen percent of patients with CHF were non-Hispanic black compared with 9.16% of patients without the comorbidity (p < 0.001).

We estimated a logistic regression for each adverse outcome with all patients combined, and Table 3 summarizes the association of CHF with adverse outcomes (n = 1,172,632). These models were adjusted for patient age, race/ethnicity, and other confounders. For these analyses, we excluded an additional 1,370 patients due

Download English Version:

<https://daneshyari.com/en/article/4290599>

Download Persian Version:

<https://daneshyari.com/article/4290599>

[Daneshyari.com](https://daneshyari.com)