

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.JournalofSurgicalResearch.com

Do patient safety indicators explain increased weekend mortality?

Rocco Ricciardi, MD, MPH, FACS,* Jason Nelson, MPH, Todd D. Francone, MD, MPH, FACS, Patricia L. Roberts, MD, FACS, Thomas E. Read, MD, FACS, Jason F. Hall, MD, MPH, FACS, David J. Schoetz, MD, FACS, and Peter W. Marcello, MD, FACS

Department of Colon and Rectal Surgery, Lahey Hospital & Medical Center, Burlington, Massachusetts

ARTICLE INFO

Article history:

Received 8 June 2015

Received in revised form

7 July 2015

Accepted 15 July 2015

Available online 22 July 2015

Keywords:

Mortality

Weekend

Patient safety indicator

Non-elective

ABSTRACT

Background: We sought to determine the differential role of patient safety indicator (PSI) events on mortality after weekend as compared with weekday admission.

Materials and methods: We evaluated Agency for Healthcare Research and Quality PSI events within a cohort of patients with nonelective admissions. First, we identified all patients with a PSI based on day of admission (weekend versus weekday). Then, we evaluated the outcome of mortality after each PSI event. Finally, we entered age, sex, race, median household income, payer information, and Charlson comorbidity scores in regression models to develop risk ratios of weekend to weekday PSI events and mortality.

Results: There were 28,236,749 patients evaluated with 428,685 (1.5%) experiencing one or more PSI events. The rate of PSI was the same for patients admitted on weekends as compared to weekdays (1.5%). However, the risk of mortality was 7% higher if a PSI event occurred to a patient admitted on a weekend as compared with a weekday. In addition, compared to patients admitted on weekdays, patients admitted on weekends had a 36% higher risk of postoperative wound dehiscence, 19% greater risk of death in a low-mortality diagnostic-related group, 19% increased risk of postoperative hip fracture, and 8% elevated risk of surgical inpatient death.

Conclusions: Risk adjusted data reveal that PSI events are substantially higher among patients admitted on weekends. The considerable differences in death after PSI events in patients admitted on weekends as compared with weekdays indicate that responses to adverse events may be less effective on weekends.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

Several studies have demonstrated increased mortality after a weekend admission for patients treated with urgent and semi-urgent diagnoses [1,2]. The range of diagnoses includes a varied list of medical and surgical diagnosis [3–11] from

gastrointestinal bleeding to surgical procedures. Given the numerous diagnoses implicated, a number of processes of care and structural elements have been investigated as potential causes. Issues related to reduced staffing and decreased access to specialized services on the weekend [12,13] have drawn considerable research interest. Staffing

Presented at the New England Surgical Society, September 2014, Stowe, Virginia.

* Corresponding author. Lahey Hospital & Medical Center, 41 Mall Rd, Burlington, MA 01805. Tel.: +1 781 744 7781; fax: +1 781 744 2945.

E-mail address: rocco.ricciardi@lahey.org (R. Ricciardi).

0022-4804/\$ – see front matter © 2016 Elsevier Inc. All rights reserved.

<http://dx.doi.org/10.1016/j.jss.2015.07.030>

concerns are substantiated by a lack of significant differences in mortality as a function of admission day for services such as trauma or burn care [12]. These protocol based services have fairly fixed staffing levels regardless of admission day or time and lack outcomes differences based on admission day. However, other medical conditions such as gastrointestinal bleeding have more variable staffing levels on nights and weekends thereby implicating structural or processes of care as more likely causes of the weekend mortality differences.

Patient safety indicators are a set of indicators providing information on potential in hospital complications and adverse events after medical care, procedures, and child birth [14]. PSIs were developed to help hospitals, provider networks, and systems identify potentially preventable adverse events in the inpatient setting. These events evaluate the spectrum of inpatient care from surgical complications to death in low-mortality diagnoses and decubitus ulcers to iatrogenic pneumothorax. Safety indicators help explain failure to rescue in patients after life-threatening illnesses and are consequently used to develop interventions aimed at reducing those patient events [15].

Central to the understanding of patient safety events is the concept of ‘failure-to-rescue’ which was first reported by Silber [16] in an evaluation of mortality after specific surgical procedures. In that analysis, the authors concluded that failure to rescue was much more dependent on hospital factors rather than patient admission factors. Similarly, we postulated that the differences in weekend mortality may be explained by the concept of failure to rescue after an adverse event (patient safety event). Our theory was that failure to rescue is more likely to occur after a weekend admission because of structural and process limitations inherent to hospitals on weekends. Thus, in this analysis, we examine both frequency and fatality (in terms of mortality) of patient safety events after a weekend admission as compared with a weekday admission. Our hypothesis was that increased mortality after a weekend admission may be explained by both increased number of patient safety events and higher mortality (failure to rescue) after those events.

2. Methods

2.1. Data source

We analyzed all-payer discharge data from the Nationwide Inpatient Sample (NIS) of the Healthcare Cost and Utilization Project of the Agency for Healthcare Research and Quality for the dates of January 1, 2003 through December 31, 2008. The NIS contains data for approximately 7 to 8 million hospital discharges per year in 1000 hospitals in over 30 states [17]. Although the hospitals sampled can vary, the population reviewed approximates a 20% sample of US community hospitals ranging from larger university hospitals to smaller regional facilities. Variables available for review include patient characteristics, socioeconomic factors, admission profiles, hospital profiles, state codes, discharge diagnoses, procedure codes, total charges, and vital status at hospital discharge. The NIS has been used extensively in population-based research and to review trends in surgical care and outcomes [18], volume and

outcomes [19], and disparities in care [20]. Our study was considered exempt by the Lahey Hospital & Medical Center Institutional Review Board and the Agency for Healthcare Research and Quality maintains a data use agreement.

2.2. Cohort

We included all discharged patients during the time frame sampled with both medical and surgical diagnoses. Next, we analyzed the elective variable to exclude patients with elective admissions whereas abstracting only patients with nonelective admissions [17]. Our final study population included only those patients with an emergency or urgent indication for admission.

2.3. Admission day

Our study analyzed admission day and grouped the responses as either a weekend or weekday. The variable was recorded as admitted during a weekend (i.e., Saturday or Sunday) or a weekday (i.e., Monday through Friday) [1,17].

2.4. Covariates

The NIS contains a number of patient factors and other characteristics associated with mortality. In our analysis, we adjusted for the following covariates: age, sex, race, income level, payer, and the Charlson comorbidity index score. Age was included as a continuous variable. Sex was entered as a dichotomous variable. Race categories were recorded as white, black, Hispanic, Asian or Pacific Islander, Native American, or other and dichotomized into white or other for covariate adjustment. Income level was categorized into quartiles per estimated median household income of residents in the patient’s zip code [17]. The median income quartiles are classified as follows: \$0–\$38999, \$39000–\$47999, \$48000–\$62999, and >\$63000 [17].

Payer information was recorded as follows: Medicare, Medicaid, private including health maintenance organization, self-pay, no charge, or other [17]. Payer entered covariate-adjusted models dichotomized into private or other. We evaluated comorbidity using the Deyo modification of the Charlson comorbidity index [21]. The index records the presence of 17 comorbid conditions and then weights them based on risk of mortality. The Charlson comorbidity index is directly related to the 1-y mortality rate [22].

2.5. Patient safety indicators

The PSIs are part of a set of software modules of the Agency for Healthcare Research and Quality Indicators developed by the University of California, San Francisco–Stanford University Evidence-based Practice Center and the University of California, Davis [23]. We evaluated version 4.4 and specifically examined PSI #2—death in low-mortality diagnostic-related group, #3—pressure ulcers, #4—death among high-risk surgical inpatients, #6—iatrogenic pneumothorax, #7—central venous catheter-related blood stream infection, #8—postoperative hip fracture, #9—postoperative hemorrhage, #12—postoperative pulmonary embolism or deep vein thrombosis,

Download English Version:

<https://daneshyari.com/en/article/4299506>

Download Persian Version:

<https://daneshyari.com/article/4299506>

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