

Taking a Day Off in the Care of Patients With Acute Decompensated Heart Failure: The Weekend Effect

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Acute decompensated heart failure (ADHF) is one of the leading causes of hospitalization in the United States,¹ and is associated with a high risk of mortality, readmissions, and healthcare cost.^{2–4} Therefore, identifying modifiable factors that influence outcomes of patients hospitalized with ADHF is of considerable research interest. One such factor is the “weekend effect” that is characterized by worse outcomes in patients admitted to the hospital on the weekend as compared with weekdays.⁵ While the weekend effect for ADHF admissions has been thoroughly studied in the past decade,^{6–10} there is a paucity of studies evaluating the association of weekend discharge with clinical outcomes.¹¹ In the accompanying report published in this issue of the *Journal of the American Heart Association (JAHA)*, Mounsey and colleagues¹² have addressed this important knowledge gap by: (1) comparing the incidence of in-hospital mortality during the weekend versus weekdays, and (2) studying the association of weekend versus weekday discharge with 28-day postdischarge mortality after hospitalization for ADHF. The study population comprised the Community Surveillance component of the ARIC (Atherosclerosis Risk in Communities) study. Eligible ADHF hospitalizations during the years 2005 to 2014 were abstracted using *International Classification of Diseases Ninth Revision, Clinical Modification (ICD-9-CM)* discharge diagnosis codes, and hospitalizations identified as definite or probable decompensated HF by a computer

algorithm and physicians of the ARIC morbidity/mortality committee were analyzed. Discharge or death on Saturday, Sunday, or a federal holiday were classified as a weekend discharge/death, whereas discharge or death on any other day of the week was classified as a weekday discharge/death. Nearly 40 000 ADHF hospitalizations were analyzed in the study, and the proportion of admissions and discharges was not evenly distributed across the days of the week—Mondays and Fridays were the most frequent days of admission and discharge, respectively. Almost 1 in 5 ADHF hospitalizations terminated on the weekend, and patients discharged on the weekend were similar to those discharged during the weekdays with regard to most clinical characteristics but were less likely to be admitted on a weekend.

This study has several noteworthy strengths including a large, sex-balanced sample derived from 4 geographically diverse American communities that comprise a well-characterized surveillance cohort. Furthermore, the ADHF hospitalizations were identified using the combination of an existing computer algorithm and physician review. The most striking observation made by Mounsey et al¹² was that patients hospitalized with ADHF had a 2-fold higher mortality risk on weekends versus weekdays (12% versus 6%). The higher risk of in-hospital mortality on weekends persisted despite controlling for potential patient- and hospital-level confounders and was consistent across HF subtypes (reduced versus preserved ejection fraction) and day of admission (weekend versus weekday). The high risk of mortality on weekends observed in this study highlights the potential gaps in care that may be related to reduced nurse, technician, or physician staffing, and decreased availability of invasive medical therapies on the weekend.⁵ Future studies are needed to better evaluate the process of care provided to patients hospitalized with ADHF during the weekdays versus weekends and identify potentially modifiable gaps in care.

In contrast with in-hospital mortality, the authors observed no association between weekend versus weekday discharge and the risk of postdischarge mortality. These findings are reassuring and ameliorate the hesitancy about discharging patients hospitalized with ADHF on the weekend. Contrary to the findings by Mounsey et al,¹² some prior studies have reported lower adherence to safe

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discharge practices and higher risk of 30-day mortality and readmission among patients with ADHF who were discharged on weekends.^{7,11} It is plausible that patients who are deemed suitable for discharge on weekends have better social support and lower disease severity, which may counterbalance some of the potentially high-risk features that have been previously attributed to weekend discharges.⁷ Future studies are needed to understand better how postdischarge care and readmission patterns may differ among patients discharged on weekends versus weekdays.

As healthcare providers, we have a responsibility to provide the best possible care to our patients on all days of the week. Findings presented by Mounsey et al¹² suggest that we need better approaches to the care of high-risk patients such as those hospitalized for ADHF on days when resources are limited. One potential strategy is to develop effective and dynamic risk prediction models that could identify hospitalized patients who are at the highest short-term risk of adverse events and may need closer monitoring during weekends. This would require development and implementation of machine learning–based algorithms that leverage the dynamic and extensive clinical data captured by electronic health records to model risk in real time for hospitalized patients. Such approaches have been used in single-center studies for high-risk conditions such as sepsis.¹³ Future studies are needed to develop and validate such machine learning–based algorithms for patients hospitalized with ADHF. Until then, we have to depend on the tried and tested strategies of detailed and informative sign-outs, close clinical monitoring, and safe discharge practices for ADHF patients to reduce the risk of avoidable adverse events on the weekends.

Disclosures

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