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Early Readmissions After ST-Segment–Elevation Myocardial Infarction: Glass Ceiling or Room for Improvement?

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Mortality attributable to ST-segment–elevation myocardial infarction (STEMI) has decreased significantly in recent years because of advances in medical therapy, widespread adoption of primary percutaneous coronary intervention, and improvement in healthcare processes.[1–3] Nonetheless, readmissions after STEMI remain both costly and common, affecting ≈20% of patients admitted with this condition.[4] In attempts to reduce both healthcare costs and improve quality of care, the Centers for Medicare and Medicaid Services established the Hospital Readmissions Reduction Program (HRRP), a program that financially penalizes hospitals with higher-than-expected rates of 30-day readmissions for several medical diagnoses, including STEMI. Whether the HRRP helps to accurately identify the underlying causes of readmissions is uncertain. Furthermore, data on the effectiveness of systems-based processes that may further reduce readmission rates after STEMI, such as universal access to health care, implementation of innovative remote monitoring and telehealth systems, and outpatient resources to support diet and medication adherence, are needed.

In this issue of the *Journal of the American Heart Association* (*JAHA*), Kim et al report the rates, causes, and costs of readmissions after STEMI between 2010 and 2014 using the National Readmissions Database.[5] There were 709 548 STEMI admissions during this period, and the 30-day readmission rate was observed to be 12.3%, substantially lower than the 20% readmission rate reported from discharges between 2005 and 2008.[6] Importantly, readmission rates declined from 13.5% in 2010 to 10.9% in 2014, representing a 19% relative decrease. Female sex, AIDS, anemia, chronic kidney disease, collagen vascular disease, diabetes mellitus, hypertension, pulmonary hypertension, congestive heart failure, atrial fibrillation, and increased length of stay during index admission were identified as independent predictors of early readmission after STEMI.[5] However, in addition to the inherent limitations of administrative data (eg, coding errors and identification of primary versus secondary diagnoses), the true underlying causes for readmission often remain elusive when using these types of administrative data sets. For example, angina and nonspecific chest pain compose ≈29% of the readmission diagnoses. These may be lower-acuity diagnoses, particularly in the setting of the recent definition of coronary anatomical characteristics, and may not necessarily be reflective of poor-quality care during the index admission. There remain many unanswered questions, such as whether access to health care that is not the emergency department plays a significant role in at least part of these lower-acuity readmissions. The authors do show that higher income levels are associated with lower readmission rates, whereas hospitals in urban settings are associated with higher readmission rates, but the causality roles remain unclear. Similarly, a recent National Cardiovascular Data Registry–based study demonstrated higher readmission rates after acute myocardial infarction (AMI) in hospitals providing care to socioeconomically disadvantaged populations.[7]

Kim et al demonstrated that higher-acuity diagnoses, such as heart failure and recurrent AMI, compose one quarter of the readmission diagnoses.[5] Whether these admissions are largely attributable to the patient's underlying comorbidities or other nonmeasured factors is uncertain. For example, how do factors such as medication adherence, adequate medication coverage, and access to outpatient support resources (eg, comprehensive cardiac rehabilitation and secondary prevention programs) contribute to these readmissions? Providers may prescribe the most effective and guideline-based therapy, but if adherence is inadequate because of poor health literacy, lack of adequate social support, polypharmacy, or high costs, early readmissions are more likely to occur. In the MI FREEE (Post-Myocardial Infarction Free Rx Event and Economic Evaluation) trial, although elimination of drug copayments did not reduce the composite primary

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outcome of first major vascular event or revascularization, full coverage did enhance medication adherence and reduce the rates of total major vascular events or revascularization without a change in overall healthcare costs.[8]

In light of such progress, has a glass ceiling been encountered, or is there more room for improvement? Although cardiac causes made up most readmissions, noncardiac causes accounted for 42%, many of which are nonmodifiable and could even be attributable to therapies used for STEMI. For example, gastrointestinal bleeding may occur because of potent antiplatelet therapies; acute renal failure may be the result of atheroembolism or contrast administration during coronary angiography; and stroke may occur as a complication of coronary revascularization as well. These are known complications of STEMI treatment that may lead to unplanned, early readmissions. Furthermore, the National Cardiovascular Data Registry study of patients presenting with AMI at sites participating in the first cycle of the HRRP demonstrated that the 30-day readmission rates were not associated with in-hospital quality of care, as defined by adherence to performance measures.[7] These considerations suggest that further refinement in quality of care during STEMI hospitalization may not translate to further reductions in readmissions, and, therefore, 30-day readmissions should continue to be a focus of investigation but not necessarily added to the AMI performance and quality metrics.[3]

The timing of readmissions reported in this analysis is also of interest. The bulk of cardiac readmissions, and of most readmissions in general, occurred within 2 weeks of hospital discharge.[5] This suggests that institutions interested in reducing readmissions could benefit from targeting this early vulnerable period. Early postdischarge visits with providers have been shown to increase medication compliance in patients after AMI, and early follow-up is associated with reduced readmissions in patients with heart failure.[9,10] The utility of innovative programs providing early discharge education, follow-up, and assistance needs to be formally tested in this population with STEMI to determine if unnecessary readmissions can be further reduced. Moreover, because most of the "late" (weeks 3 and 4 postdischarge) and post–coronary artery bypass grafting 30-day readmissions were noncardiac in cause, the value of associating penalties with such readmissions may warrant reconsideration. Finally, some insurance plans require "step" therapy to keep costs low. In these scenarios, a patient must demonstrate failure with a lower-cost medication first before escalation to more expensive medications. However, this process is individualized on the basis of the patient's managed care plan rather than the actual needs of the individual patient, and the change of medication at the pharmacy counter is not always apparent to the prescribing physician. As a result, although a patient may be adherent to the class of medication prescribed, the patient may not have received the most effective medical therapy that was prescribed at discharge, which may lead to interim events resulting in readmission. This potential factor needs to be acknowledged in future studies.

It is reassuring to note that 30-day readmissions have declined ≈20% during the study period, a time frame that corresponds to the Centers for Medicare and Medicaid Services implementation of the HRRP. Although the exact cause of the readmission decrease is not entirely known, it is intuitive to speculate that financial pressure drove at least some of the reductions. This is acceptable as long as patient outcomes do not worsen as a result. Indeed, reductions in readmission for other cardiac conditions after HRRP implementation have been associated with worse outcomes, including increased mortality.[11] In the population with STEMI, higher 30-day readmissions were determined not to be associated with long-term outcomes.[7]

Kim et al[5] are to be commended for performing a thoughtful, contemporary analysis examining the current state of STEMI readmissions. As in other analyses, the authors have largely identified patient variables that may not be modifiable. This highlights the need for stakeholders to make an investment in evaluating the impact of environmental factors, large health system processes, social support resources, and healthcare policies in relation to post-STEMI care. Otherwise, further reductions in hospital readmissions seem optimistic at best.

Disclosures

None.

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