Recent Declines in Hospitalizations for Acute Myocardial Infarction for Medicare Fee-for-Service Beneficiaries

Progress and Continuing Challenges

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Background—Amid recent efforts to reduce cardiovascular risk, whether rates of acute myocardial infarction (AMI) in the United States have declined for elderly patients is unknown.

Methods and Results—Medicare fee-for-service patients hospitalized in the United States with a principal discharge diagnosis of AMI were identified through the use of data from the Centers for Medicare and Medicaid Services from 2002 to 2007, a time period selected to reduce changes arising from the new definition of AMI. The Medicare beneficiary denominator file was used to determine the population at risk. AMI hospitalization rates were calculated annually per 100 000 beneficiary-years with Poisson regression analysis and stratified according to age, sex, and race. The annual AMI hospitalization rate in the fee-for-service Medicare population fell from 1131 per 100 000 beneficiary-years in 2002 to 866 in 2007, a relative 23.4% decline. After adjustment for age, sex, and race, the AMI hospitalization rate declined by 5.8%/y. From 2002 to 2007, white men experienced a 24.4% decrease in AMI hospitalizations, whereas black men experienced a smaller decline (18.0%; $P<0.001$ for interaction). Black women had a smaller decline in AMI hospitalization rate compared with white women (18.4% versus 23.3%, respectively; $P<0.001$ for interaction).

Conclusions—AMI hospitalization rates fell markedly in the Medicare fee-for-service population between 2002 and 2007. However, black men and women appeared to have had a slower rate of decline compared with their white counterparts. **(*Circulation*. 2010;121:1322-1328.)**

Key Words: epidemiology ■ infarction ■ vital statistics

Improvements in the prevention and treatment of cardiovascular disease should lead to a substantial decrease in hospitalization rates for acute myocardial infarction (AMI). For the general population, there is evidence of recent improvements in the control of hypertension, hypercholesterolemia, and smoking,[1–3] but obesity and diabetes mellitus are becoming more common.[4,5] Unfortunately, the United States lacks a national surveillance system for assessing the incidence of AMI. Community-based surveillance studies have provided conflicting perspectives on changes in the AMI hospitalization rate, with some studies suggesting little or no change[6,7] and others indicating a modest decline.[8–11] However, the latest assessment of AMI outcomes from these surveillance systems was from the 1990s. A more recent and national study of changes in AMI rates is needed to understand contemporary trends.

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Evaluating trends in AMI incidence for the elderly warrants particular attention because cardiac risk factor management is more challenging for these patients. Control of hypertension declines as patient age increases, particularly for women.[12] Adherence to statin therapy is markedly lower for older patients.[13,14] The prevalence of smoking has declined more slowly for elderly compared with younger patients.[15] Among the elderly, rates of obesity have increased,[16] but rates of diabetes mellitus appear to have slowed during this

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decade.[17] The net effect on AMI incidence is unknown, especially for the very oldest patients.

Medicare records provide an opportunity to assess national trends in AMI hospitalization rates in the elderly. Administrative codes can identify beneficiaries hospitalized for AMI, and the Medicare administrative file can construct a well-defined denominator population at risk. Here, we analyze a 100% Medicare fee-for-service cohort from 2002 to 2007 representative of the new definition of AMI introduced in 2000[18] to examine the hypothesis that AMI hospitalization rates have fallen in the elderly.

The authors assume full responsibility for the accuracy and completeness of the ideas presented. The Centers for Medicare and Medicaid Services reviewed and approved the use of its data for this work and approved submission of the manuscript; this approval is based on data use only.

Methods

Data

We used data from the Centers for Medicare and Medicaid Services to examine AMI hospitalization rates in the Medicare fee-for-service population. Fee-for-service Medicare is the federal health insurance program in which beneficiaries have unrestricted choice of physician and hospital. Although most Medicare beneficiaries are enrolled in fee-for-service, a smaller proportion (≈23% in 2008) are enrolled in Medicare managed care programs (ie, Medicare Advantage) administered by private health insurers with varying levels of premiums and limits on the choice of healthcare providers.[19] Medicare Advantage hospitalizations were not available from the Centers for Medicare and Medicaid Services and were not included in this analysis.

Medicare fee-for-service hospitalizations from 2002 to 2007 were identified from the Medicare Provider Analysis and Review database. This inpatient database contains claims data submitted by hospitals for reimbursement and includes patient demographics (age, sex, race), diagnosis codes, discharge status, and length of stay. In September 2000, a new definition of AMI developed by the European Society of Cardiology/American College of Cardiology was published.[18] Because the apparent incidence of AMI would be expected to rise as a result of the definition change,[20–23] we selected hospitalizations since 2002 to limit the potential effect of the AMI definition change on our findings.

The overall population at risk for AMI consisted of fee-for-service beneficiaries in the Medicare denominator file. The denominator file contains information about each beneficiary enrolled in Medicare during a calendar year, including demographic characteristics, entitlement, and participation in Medicare. The denominator of beneficiaries at risk for AMI hospitalization consisted of patient-years of beneficiaries ≥65 years of age who were enrolled in Medicare fee-for-service for at least 1 month in at least 1 study year.

Definition of AMI

A hospital admission was classified for AMI if the principal discharge diagnosis code was *International Classification of Diseases*, 9th revision, clinical modification (ICD-9-CM) 410.xx, excluding cases for which the last digit was 2 (410.x2), which does not indicate an acute event. The principal discharge diagnostic code is defined as "the diagnosis established after study to be chiefly responsible for occasioning the admission of the patient for hospitalization."[24] Because patients with a total length of stay of ≤1 day who were discharged alive and not against medical advice were unlikely to have had an AMI, these patients were excluded. Patients who were transferred to another acute care hospital were linked and considered as a single continuous episode of care.

Statistical Analysis

The AMI hospitalization rate was expressed as the number of AMI hospitalizations for a given year divided by the number of beneficiary-years observed in the Medicare fee-for-service beneficiary denominator file, reported on a per–100 000 beneficiary-years basis. Analyses of changes in the AMI hospitalization rate were conducted, controlling for patient age (categorized as 65 to 74, 75 to 84, and ≥85 years), sex, and race. After cross-classifying beneficiaries by age, sex, race, and occurrence of at least 1 AMI hospitalization per year, we estimated the log risk of an AMI using Poisson regression via the Poisson procedure in Stata version 10.0 (Stata Corp, College Station, Tex). Beneficiary data were collapsed by group level (by age group, by sex, and by race), and a Poisson model was used to estimate cell counts for each age-sex-race category. This procedure modeled the expected number of AMI admissions per beneficiary-year as a function of the demographic variables and person-years as the unit of exposure. The annual change in the AMI hospitalization rates was reported using the incidence rate ratio (IRR) and its corresponding 95% confidence interval (CI). Additional descriptive statistical analyses of hospitalization rates were conducted with SAS version 9.1.3 (SAS Institute Inc, Cary, NC). Although unadjusted hospitalization rates for patients of "race other than white or black" were reported for completeness, multivariate analyses of trends in AMI hospitalization by race examined only white and black patients, given the heterogeneity of races in the "other" race category.

To assess the contribution of recurrent AMI admissions, we examined the distribution of hospitalizations that reflected a repeat AMI admission for a given patient during a given year. To evaluate whether differences in medical coding could explain changes in AMI hospitalization rates, we examined other common cardiac conditions with principal discharge codes other than AMI, including unstable angina (ICD-9-CM 411), coronary artery disease (ICD-9-CM 414), heart failure (ICD-9-CM 428), and dysrhythmias (ICD-9-CM 427).

We compared trends in the annual AMI hospitalization rate against trends in the overall annual hospitalization rate of the Medicare population for all principal discharge diagnoses other than AMI. The overall hospitalization rate used the same denominator of Medicare beneficiaries examined for the AMI hospitalization rate; the numerator consisted of all Medicare fee-for-service hospitalizations in a given year, excluding those admissions for AMI. All patients, except those with a primary discharge diagnosis of AMI as described above, who were in Medicare fee-for-service for at least 1 month in a given year were included in the overall hospitalization rate.

Results

Patient characteristics are presented in Table 1. The denominator of Medicare beneficiaries-years ranged from 28 273 036 in 2002 to 27 836 065 in 2007. Approximately 86% of Medicare beneficiaries were represented in the denominator for ≥2 years. The mean age was 75.3 years (SD, 7.7 years). Overall, 58% of beneficiaries were women, 8% were black, and 6% were of race other than white or black.

The observed annual AMI hospitalization rate declined from 1131 per 100 000 beneficiary-years in 2002 to 866 per 100 000 beneficiary-years in 2007, an absolute decline of 265 AMI hospitalizations per 100 000 beneficiary-years and a relative decline of 23.4%. The unadjusted relative reduction in the annual AMI hospitalization rate was 5.6% (IRR, 0.94; 95% CI, 0.94 to 0.95). After adjustment for age, sex, and race, the mean annual relative decrease in the AMI hospitalization rate was 5.8% (IRR, 0.94; 95% CI, 0.94 to 0.94).

Recurrent AMI hospitalizations within a given year represented 6.9% of all AMI hospitalizations in 2002; this proportion decreased to 5.1% in 2007. The fall in recurrent AMI hospitalizations represented a small contribution to the over-

Table 1. Patient Characteristics of AMI and Non-AMI Hospitalizations per Year, 2002 to 2007

Characteristics	2002	2003	2004	2005	2006	2007
Fee-for-service beneficiaries						
Denominator, person-y	28 273 036	28 743 718	29 027 774	29 075 511	28 378 850	27 836 065
Mean age (SD), y	75.3 (7.5)	75.3 (7.6)	75.3 (7.6)	75.3 (7.7)	75.3 (7.7)	75.3 (7.8)
White, %	86.7	86.5	86.4	86.2	86.3	86.0
Black, %	8.0	8.0	8.0	8.0	7.9	8.0
Other, %	5.3	5.5	5.6	5.8	5.8	6.0
Female, %	58.6	58.4	58.1	57.9	57.7	57.4
Non-AMI hospitalizations						
Patients, n	6 012 393	6 081 277	6 092 107	6 129 893	5 889 246	5 693 295
Mean age (SD), y	77.5 (7.7)	77.5 (7.7)	77.5 (7.8)	77.6 (7.8)	77.7 (7.9)	77.7 (7.9)
Age 65–74, %	38.9	38.7	38.7	38.4	38.1	38.0
Age 75–84, %	41.3	41.4	41.3	41.3	41.0	40.3
Age ≥85, %	19.8	19.9	20.0	20.3	20.9	21.7
White, %	87.4	87.3	87.1	87.0	87.2	87.2
Black, %	8.7	8.7	8.7	8.7	8.6	8.5
Other, %	3.9	4.0	4.1	4.3	4.2	4.3
Women, %	59.2	59.0	58.9	58.6	58.1	58.3
AMI hospitalizations						
Patients, n	297 653	293 087	279 426	264 189	240 288	228 170
Mean age (SD), y	77.9 (7.8)	78.0 (7.8)	78.0 (7.9)	78.2 (8.0)	78.2 (8.0)	78.3 (8.1)
Age 65–74 y, %	37.0	36.3	36.2	35.9	36.1	35.8
Age 75–84 y, %	41.3	41.3	41.1	40.8	40.1	39.4
Age ≥85 y, %	21.7	22.3	22.6	23.3	23.7	24.8
White, %	89.1	88.7	88.6	88.5	88.5	88.3
Black, %	7.0	7.2	7.2	7.2	7.4	7.5
Other, %	3.9	4.1	4.2	4.3	4.1	4.2
Women, %	50.2	50.0	50.0	49.5	49.5	50.0

all decrease in the annual AMI hospitalization rate; admissions for recurrent AMI decreased from 68 to 41 per 100 000 beneficiary-years between 2002 and 2007. The resulting decline of 27 AMI admissions per 100 000 beneficiary-years attributable to a decline in repeat admissions explained only 10% of the overall decline in the annual AMI hospitalization rate of 265 per 100 000 beneficiary-years over this time period.

The annual AMI hospitalization rate declined faster than the overall hospitalization rate (excluding AMI) for all other conditions. The 5 most frequent principal discharge diagnoses other than AMI by ICD-9-CM codes were heart failure 428.xx (7.7%), pneumonia 486.xx (6.1%), chronic ischemic heart disease/atherosclerosis 414.xx (6.1%), cardiac dysrhythmias 427.xx (4.7%), and osteoarthritis 715.xx (4.0%). The annual overall non-AMI hospitalization rate declined from 34 202 to 32 072 per 100 000 beneficiary-years, an absolute decline of 2130 hospitalizations per 100 000 beneficiary-years and a relative 6.2% decline over 5 years.

Annual hospitalization rates for cardiac conditions other than AMI also declined from 2002 to 2007 (Table 2). The annual hospitalization rate for a principal discharge diagnosis of unstable angina declined from 136 to 55 per 100 000 beneficiary-years, a relative decrease of 59.2%; heart failure declined from 2152 to 1892 per 100 000 beneficiary-years (−12.1%); coronary artery disease declined from 1744 to

Table 2. Annual Hospitalization Rate for AMI and Other Cardiac Conditions per 100 000 Medicare Fee-for-Service Beneficiaries-Years

Hospitalizations (ICD-9-CM code)	2002	2003	2004	2005	2006	2007	Change From 2002–2007, %
AMI (410)	1131	1093	1021	961	893	866	−23.4
Unstable angina (411)	136	108	90	75	63	55	−59.2
Coronary artery disease (414)	1744	1695	1692	1575	1506	1305	−25.2
Heart failure (428)	2152	2218	2195	2112	2015	1892	−12.1
Dysrhythmias (427)	1361	1316	1303	1272	1284	1300	−4.5

Table 3. Annual AMI Hospitalization Rates by Sex and Race per 100 000 Medicare Fee-for-Service Beneficiaries-Years

	2002	2003	2004	2005	2006	2007	Change From 2002–2007, %
Men, n							
All	1344	1296	1204	1138	1055	1017	−24.3
White	1389	1335	1239	1173	1086	1050	−24.4
Black	1073	1075	1000	951	913	880	−18.0
Other	997	981	934	857	774	716	−28.2
Women, n							
All	981	948	890	833	775	754	−23.1
White	994	960	901	844	783	762	−23.3
Black	1000	973	910	860	844	816	−18.4
Other	733	723	685	634	558	546	−25.5
Age categories, n							
65–74 y	790	752	700	653	612	585	−26.0
75–84 y	1319	1273	1188	1114	1027	994	−24.6
≥85 y	2053	2029	1904	1822	1672	1647	−19.8
Overall	1131	1093	961	961	893	866	−23.4

1305 per 100 000 beneficiary-years (−25.2%); and cardiac dysrhythmias declined from 1361 to 1300 per 100 000 beneficiary-years (−4.5%).

After stratification by age categories, the annual AMI hospitalization rate from 2002 to 2007 declined by a relative 26.0% for patients 65 to 74 years of age, 24.6% for patients 75 to 84 years of age, and 19.8% for patients ≥85 years of age (Table 3). Over 5 years, men had a relative 24.3% decline in AMI hospitalizations, from 1344 to 1017 per 100 000 beneficiary-years; women had a relative 23.1% decline in AMI hospitalization rate, from 981 to 754 per 100 000 beneficiary-years (Table 3 and the Figure).

White men experienced a relative 24.4% decrease in the annual AMI hospitalization rate from 1389 to 1050 per 100 000 beneficiary-years from 2002 to 2007; this represents an age-adjusted annual decline of 6.0% (IRR, 0.94; 95% CI, 0.94 to 0.94). Black men experienced a smaller decline in the observed AMI hospitalization rate from 2002 to 2007 (1,073 to 880 per 100 000 beneficiary-years) with an age-adjusted annual decline of 4.2% (IRR, 0.96; 95% CI, 0.95 to 0.96) compared with white men ($P<0.001$ for interaction of race and time). White women had a decline in the annual AMI hospitalization rate from 2002 and 2007 (994 to 762 per 100 000 beneficiary-years), representing an age-adjusted annual decline of 5.8% (IRR, 0.94; 95% CI, 0.94 to 0.94). During the same period, the annual AMI hospitalization rate declined from 1000 to 816 per 100 000 beneficiary-years for black women, representing an age-adjusted annual decline of 4.1% (IRR, 0.96; 95% CI, 0.95 to 0.96). The age-adjusted rate of decline in the AMI hospitalization rate was lower for black women compared with white women, ($P<0.001$ for interaction of race and time).

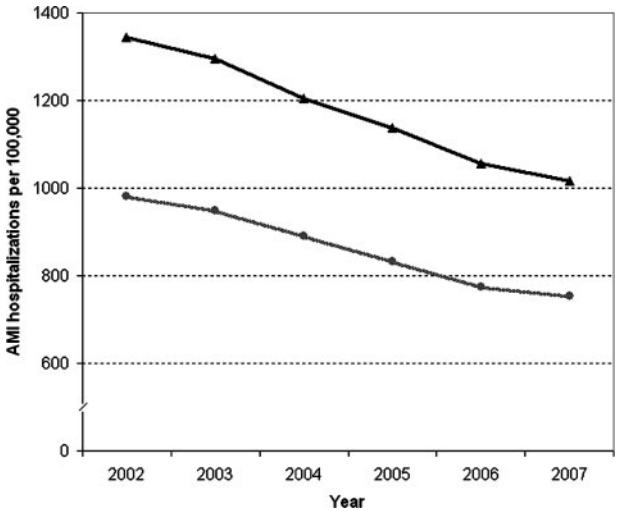

Figure. Acute myocardial infarction hospitalization rate for men and women, 2002 to 2007 (per 100 000 beneficiary-years). Note that AMI hospitalization rates per 100 000 beneficiary-years were not adjusted for age. Rates for men are represented by triangles; rates for women, by circles.

Discussion

Our study found that the annual AMI hospitalization rate in the Medicare fee-for-service population fell by 265 per 100 000 beneficiary-years from 2002 to 2007, a relative decline of 23.4%. This decline corresponds to ≈80 000 fewer AMI hospitalizations for ≈30 million Medicare fee-for-service beneficiaries in 2007 compared with 2002. Extrapolated to the entire Medicare population of ≈45 million in 2007, this represents 119 000 fewer AMI hospitalizations in 2007 compared with 2002 among all beneficiaries ≥65 years of age.

The fall in the AMI hospitalization rate appeared unrelated to changing demographics of the fee-for-service Medicare population. The age, sex, and racial composition of our cohort remained stable over time, and a relative annual 5.8% decline in the AMI hospitalization rate was still observed even after adjustment for these factors. The decline in AMI hospitaliza-

tions rate did not appear to be due to general secular trends in hospitalizations because the AMI hospitalization rate fell faster than the overall hospitalization rate for the Medicare population.

There are several potential explanations for the marked decline in AMI hospitalization rates. Changes in the sensitivity of ICD-9-CM codes for capturing AMIs could potentially explain the observed changes in AMI hospitalization rates. Older studies have suggested that ICD-9 codes have reasonable accuracy for capturing clinically confirmed AMIs,[25,26] but further investigation into current medical coding practices is warranted. Our study did find that cardiac conditions that may have been coded instead of AMI such as unstable angina, heart failure, coronary artery disease, and dysrhythmia have also fallen over time, suggesting that there has not been a dramatic shift in coding hospitalizations away from AMI to these particular conditions.

An increase in out-of-hospital sudden cardiac death can potentially explain a decline in AMI hospitalizations. Although recent data on sudden cardiac death are sparse, studies of earlier cohorts have demonstrated declines in the rate of sudden cardiac death in the Framingham[27] and Worcester[28] cohorts. Data from the Atherosclerosis Risk in Communities (ARIC) study reported that the rate of sudden death from coronary heart disease declined from 1987 to 2004.[29] As such, it would appear unlikely that an increase in sudden cardiac death rates resulted in a national decrease in AMI hospitalizations.

We are left with the conjecture that the decline in AMI hospitalizations parallels a true decrease in AMI incidence. A recent analysis examining improvements in survival for coronary artery disease suggested that better outcomes were attributed to both improving risk factor profiles and greater use of treatments such as pharmacotherapy and coronary revascularization.[30] We speculate that a similar set of factors explains a decline in AMI incidence. Management of cardiovascular risk factors has improved with respect to decreasing prevalence of hypertension, hyperlipidemia, and smoking before our study period,[3,31,32] along with increasing use of antihypertensive medications[1] and statins[2] immediately before our study period. Although our data were unable to directly assess use of percutaneous coronary intervention or bypass surgery, coronary revascularization has increased over time.[33] These trends in risk factor management and clinical treatments provide circumstantial evidence that the decrease in AMI hospitalizations reflects an actual decline in AMI incidence. Although administrative data suggest that AMI cases have fallen over time, understanding the specific reasons for this decline requires additional study based on clinical data.

A strength of our study is its inclusion of the entire population of Medicare fee-for-service beneficiaries, including the oldest patients. Community-based studies have typically limited the upper age of their cohorts[6,9,11]; 1 study did not include patients >65 years of age.[10] Of the 2 studies that included AMI patients of any age, trends in AMI hospitalization rates were available only to 1995.[7,8] Our study extends prior work to suggest that elderly patients appear to be at lower risk of having an AMI in recent years, even the very oldest.

A national decline in AMI hospitalizations in the Medicare population is consistent with studies using administrative data that consider all patient ages. A brief report from the Centers for Disease Control and Prevention documented a 25% relative decline in AMI hospitalizations from 308 to 231 per 100 000 individuals from 1996 to 2005 using data from the National Hospital Discharge Survey.[34] Another study based on hospital discharges in the United States found that AMI hospitalizations declined from 309 to 266 per 100 000 individuals from 2002 to 2005.[35] Future studies from community-based surveillance studies are needed to confirm the decline in AMI incidence using clinical criteria.

Not all patient groups appear to have similar declines in the AMI hospitalization rate. The finding that black men and women experienced a lower decline in AMI hospitalization rate than their white counterparts raises the concern that efforts to control coronary artery disease risk factors may be less effective for black patients. Data from the Third National Health and Nutrition Examination Survey (NHANES) support the hypothesis that elderly blacks have worse control of cardiac risk factors compared with whites.[36] Older black women had significantly higher prevalence of diabetes mellitus, abdominal obesity, hypertension, and physical inactivity than white women; older black men had higher prevalence of hypertension and physical inactivity than white men.[36] An analysis of the Heart and Estrogen/Progestin Replacement Study also found that black women were less likely to have optimal blood pressure and cholesterol control compared with white women.[37] These findings imply that better control of coronary artery disease risk factors in black patients may potentially reduce the racial disparity seen in the improvements in AMI hospitalization rates.

Our study found that elderly black men had lower hospitalization rates for AMI compared with white men. A similar pattern has been observed in other studies; eg, AMI incidence was lower for black men compared with white men in the Cardiovascular Health Study[38] in patients ≥65 years of age, whereas black men had higher AMI incidence in the ARIC cohort,[39] which included younger patients (45 to 84 years of age). Data from the first NHANES study also reported that black men had lower AMI incidence compared with white men among those ≥55 years of age but similar incidence of coronary heart disease compared with white men among those <55 years of age.[40] This phenomenon may represent a survivorship effect if black men had higher competing risks of causes of death at younger ages compared with white men, a process that would result in a cohort of elderly black Medicare patients with more favorable risk profiles than their white counterparts. The first NHANES study reported that all-cause mortality was higher for black compared with white patients in all age categories, a finding consistent with this hypothesis.[40]

The AMI incidence rates among women ≥65 years of age were similar to slightly lower for blacks compared with whites in the Cardiovascular Health Study[38] and the first NHANES study.[40] Although in our study the declines in AMI hospitalization rates between white and black women were

similar from 2002 to 2005 (−15.1% versus −14.0%), white women had a steeper decline in AMI rates after 2005, leading to an eventual larger overall decline in AMI rates from 2002 to 2007 for white women compared with black women (−23.3% versus −18.4%). The reason for the increasing disparity in recent years between black and white women is unknown but concerning and should be the focus of future investigation.

Limitations

This study examines fee-for-service patients and does not include Medicare patients in managed care programs; patients in managed care represented 19% of all Medicare beneficiaries in 2006.[41] It unlikely that changes in the rate of AMI hospitalizations have resulted from the flow of patients between fee-for-service and Medicare managed care because Medicare managed care patients are typically healthier than fee-for-service patients.[42–44] A decline in AMI hospitalizations would necessitate an unlikely inflow of lower-risk patients from Medicare managed care to fee-for-service, the opposite of what would be expected.

Use of administrative rather than clinical data to ascertain AMI is a limitation. However, there is a reasonably high positive predictive value for Medicare administrative claims correlating with clinically confirmed AMIs,[45] and precedence exists for using administrative databases to form surveillance systems of AMI incidence and prevalence.[46] It is unlikely that the sensitivity of ICD-9-CM codes would decline substantially and consistently over time to explain the overall downward trend in AMI rates. The ability of ICD-9-CM codes to detect AMIs has been shown to vary with race,[25] which may explain some of the differences in AMI rates between white and black patients but is unlikely to alter trends observed within racial categories.

Lastly, Medicare billing codes are unable to distinguish between a prior AMI from a hospitalization with a non-AMI principal diagnosis and a secondary diagnosis of AMI. Thus, our study is unable to determine whether AMI codes have shifted from principal to secondary diagnosis categories.

Conclusions

AMI hospitalization rates decreased by 23.4% for the fee-for-service Medicare population from 2002 to 2007. However, the decline in AMI hospitalization rates appears slower for black men and women compared with white beneficiaries. Further surveillance of AMI trends is warranted to ensure that AMI incidence continues to decline and that all demographic groups benefit equally.

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Disclosures

None.

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CLINICAL PERSPECTIVE

Recent improvements in the prevention and treatment of cardiovascular disease should lead to decreased rates of acute myocardial infarction (AMI). However, the United States currently lacks a national surveillance system for assessing the incidence of AMI, and community-based studies are somewhat conflicting. A contemporary national evaluation of AMI rates is needed to determine whether AMI rates have decreased across demographic groups. Using administrative data from a national sample of Medicare fee-for-service beneficiaries from 2002 to 2007, we found that rate of hospitalizations with a principal discharge diagnosis of AMI declined from 1131 to 866 per 100 000 beneficiary-years, a relative decline of 23.4%. The AMI hospitalization rate fell faster than hospitalizations for all diagnoses other than AMI. Elderly black men and women had smaller declines in AMI hospitalization rates compared with white men and women. Our findings suggest that AMI incidence has decreased substantially for elderly Americans during this time, but additional research is required to evaluate why the declines appears slower for black patients compared with white patients.

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Recent Declines in Hospitalizations for Acute Myocardial Infarction for Medicare Fee-for-Service Beneficiaries: Progress and Continuing Challenges

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