Association of medical noncompliance and long-term adverse outcomes, after myocardial infarction in a minority and uninsured population

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The association of noncompliance with evidence-based medical therapies after myocardial infarction (MI) on long-term outcomes is not well recognized in minority and uninsured populations. Consecutive MI patients at a large urban hospital were followed for compliance with evidence-based medications (aspirin, clopidogrel, statins, beta blockers, and angiotensin converting enzyme inhibitors (ACEIs)/angiotensin receptor blockers (ARBs)). Noncompliance was defined as proportion of days covered $\leq$ 80%. The outcome was combined mortality and MI. Kaplan-Meier analyses were used to explore the impact of noncompliance $\geq$ 4 medications. Of the 509 patients (86% minorities, 77% uninsured, and 54% diabetics), 132 (25.9%) presented with ST segment elevation with myocardial infarction (STEMI) and 377 (74.1%) with a non-ST segment elevation with myocardial infarction (NSTEMI), revascularization was performed in 297 (58.4%) patients, 72 (14.2%) patients died, 22 (4.3%) patients had an MI, and 91 (17.9%) patients had either event at a median follow-up of 2 (0.5–2.9) years. Noncompliance $\geq$ 4 medications was significantly associated with adverse survival compared with compliant patients (29.7% vs 78.9%). After adjusting for traditional risk factors, The Global Registry of Acute Coronary Events risk score for predicting death during 6 months post-discharge, revascularization, left ventricular (LV) function, coronary artery disease (CAD) severity, and punctual clinic visits, noncompliance with $\geq$ 4 evidence-based medications was an independent factor associated with death or MI (hazard ratio (HR), 2.83; 95% confidence interval (CI) = 1.60–5.01) in this minority and uninsured population. (Translational Research 2009;154:78–89)

Abbreviations: ACEI = angiotensin converting enzyme inhibitors; ACS = acute coronary syndrome; ANOVA = analysis of variance; ARB = angiotensin receptor blockers; BB = beta-blockers; CABG = coronary artery bypass graft; CAD = coronary artery disease; CI = confidence interval; ECG = electrocardiogram; GRACE = The Global Registry of Acute Coronary Events; HR = hazard ratio; MI = myocardial infarction; NSTEMI = non-ST segment elevation with myocardial infarction; PCI = percutaneous coronary intervention; STEMI = ST segment elevation with myocardial infarction

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AT A GLANCE COMMENTARY

Background

The association of noncompliance with evidence-based medical therapies after myocardial infarction (MI) on long-term outcomes is not well recognized, particularly in minority and uninsured populations. We therefore conducted this study in consecutive MI patients admitted at a large urban public hospital, where the association of long-term compliance with evidence-based medical therapies (aspirin, clopidogrel, statins, beta blockers, and angiotensin converting enzyme inhibitors/angiotensin receptor blockers) with the primary combined outcome of mortality and MI, was ascertained via Kaplan-Meier and Cox regression analyses.

Translational Significance

Noncompliance $\geq$ 4 medications was significantly associated with adverse survival compared with compliant patients (29.7% vs 78.9%). After adjusting for traditional cardiovascular risk factors, The Global Registry of Acute Coronary Events risk score for predicting death during 6 months post-discharge, revascularization, presentation acuity, left ventricular function, coronary artery disease severity, frequency of medication refills, and punctual clinic visits in a multivariable model, noncompliance with $\geq$ 4 evidence-based medications was an independent factor associated with death or MI (hazards ratio = 2.83; 95% confidence interval = 1.60–5.01) in this minority and uninsured population.

Advances in medical therapy of myocardial infarction (MI) and adherence to guidelines recommended medications at discharge have resulted in a significant decline in hospital and short-term mortality.[1-4] Additionally, long-term adherence to medications after the index MI event has led to a further drop in adverse events during long-term follow-up.[1,5-10]

Studies evaluating the impact of noncompliance to medications at discharge and long-term follow-up after hospitalization for an MI have mostly excluded the minority, ethnically diverse, uninsured public health system population.[1,7-9] These populations have been reported to be at a higher risk for medication nonadherence, have a higher burden of disease, and have been reported to receive less aggressive medical and revascularization therapies during hospitalization for the index MI event and, later, during long-term follow-up.[11-18] Paradoxically, outcomes and medical noncompliance data on these populations are severely lacking, primarily because of the unavailability of data from institutions that care for such patient populations.[19-21]

Therefore, we conducted this study with the following specific aims: first, to find out the prevalence of medical noncompliance to guidelines-based medications after hospitalization for an MI event among this disadvantaged population and, second, to ascertain the long-term association of this noncompliance with future risk of death and MI.

METHODS

Patient sample. Consecutive patients admitted to the coronary intensive care unit at Cook County Hospital in Chicago with an MI (ST segment elevation myocardial infarction [STEMI] or non-ST segment elevation myocardial infarction [NSTEMI]) from January 1, 2003 to December 31, 2004, were included in this study. The medical records of all patients admitted to the coronary intensive care unit in this time period were reviewed to confirm the diagnosis of an MI. An MI was defined using the following criteria: elevated biomarkers (troponin level or creatine kinase MB fraction) and other supporting evidence (ischemic signs/symptoms, ST-T changes on electrocardiogram [ECG], or both). Patients with unstable angina (defined as ischemic signs/symptoms [at rest or their recent worsening in frequency, duration or intensity], ST-T changes on ECG, or both, and negative cardiac biomarkers), admitted to the coronary care unit were excluded. Patients with decompensated congestive heart failure, arrhythmias, sepsis, and pacemaker placement were excluded despite positive cardiac biomarkers. Patients not residing in Cook County or neighboring counties (via a search of self-reported address zip codes) were excluded. We also excluded patients who died in the hospital. Institutional review board approval was obtained at the participating institution.

Data collection. All data were collected retrospectively via detailed chart review of the electronic medical records. The medical record abstraction was performed by trained data collectors, which included data regarding patients' presentation, clinical history, presenting electrocardiogram, and baseline laboratory results. Then, from the discharge records, data on patients' diagnostic findings (including the results of angiography and echocardiography), in-hospital medical and surgical revascularization therapies, in-hospital complications, discharge medications, and final diagnoses were collected. Last, from pharmacy and clinic records, data on the number of clinic visits, prescription refills of the 5 classes of medications (aspirin, clopidogrel, angiotensin converting enzyme inhibitors or angiotensin receptor blockers converting enzyme inhibitors [ACEIs]/angiotensin receptor blockers [ARBs], beta-blockers [BB] and