Use of Health Care System-Supplied Aspirin by Veterans With Postoperative Heart Attack or Unstable Angina

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Abstract: Evidence-based guidelines for the use of aspirin in secondary prevention of cardiovascular disease events are well established. Despite this, the prevalence of aspirin use for secondary prevention is suboptimal. The study aimed to determine the prevalence of aspirin use for secondary prevention of cardiovascular disease events when it is dispensed as a prescription, as is performed in the Veterans Affairs (VA) managed care system. VA patients who had undergone major surgery and experienced a postoperative myocardial infarction (MI) or unstable angina between the years 2005 and 2009 were identified from administrative databases. VA pharmacy records were used to determine whether a prescription for aspirin was filled after the postoperative MI or unstable angina. Multivariable logistic regression models estimated odd ratios of filling aspirin prescriptions for the predictors of interest. Of the 321,131 men and women veterans who underwent major surgery, 7,700 experienced a postoperative MI or unstable angina. Among those 7,700, 47% filled an aspirin prescription. Only 59% of veterans with no co-pay filled an aspirin prescription. Aspirin fills were more common in younger veterans, Blacks, Hispanics, males, hypertensive veterans, mentally ill patients, those with no co-pay and those prescribed antiplatelets/anticoagulants in addition to aspirin postoperatively. These findings suggest that the impact of dispensing aspirin as a prescription may not be significant in increasing the appropriate use of aspirin for secondary prevention.

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Cardiovascular disease (CVD) is the leading cause of death in the United States.[1] Studies have demonstrated a decreased yearly risk of serious CVD events (nonfatal myocardial infarction [MI], nonfatal stroke or vascular death) associated with the use of aspirin for secondary prevention of CVD by 21% to 32%.[2,3] Specific evidence-based guidelines for aspirin use for secondary prevention of CVD have been published.[4,5] These guidelines are supported by evidence from multiple randomized controlled trials that have demonstrated a decreased risk of CVD events and deaths associated with the use of aspirin for secondary prevention.[2,3,6] Although randomized controlled trials have demonstrated a benefit from aspirin use, multiple studies have found that the reported prevalence of aspirin use for secondary prevention of CVD is low.[7–13]

Aspirin is an important, inexpensive and easily accessible therapy for CVD. Accurate knowledge of aspirin utilization for CVD prevention is problematic because it is typically purchased over the counter and not commonly dispensed by a pharmacy. It was hypothesized that dispensing aspirin as a prescription would be associated with a higher prevalence of aspirin use for secondary prevention of CVD events for veterans without co-pays because the aspirin would be free of charge. The Veterans Affairs (VA) managed care system dispenses aspirin as a prescription, providing an excellent setting in which to test this hypothesis. The objectives were to determine (1) what percentage of men and women seeking care in the VA were following national guidelines for taking prescriptive aspirin after an episode of postoperative MI or unstable angina (secondary prevention) and (2) what factors were associated with prescriptive aspirin use in the VA-managed care system. Previously mental health-related outcomes in this postoperative group of VA patients have been examined.[14]

METHODS

Setting and Study Design

VA patients who had undergone major surgery during the fiscal years 2005 to 2009 (October 2004–September 2009) were identified using procedure codes recorded in administrative databases stored at the VA's central repository as part of the Surgical Treatment Outcomes for Patients with Psychiatric Disorders (STOPP) study.[14] All were veterans eligible for care at the VA per VA priority score 1 to 8 based on military service-connected experiences, poverty and disability. Among these patients, postoperative MI or episode of unstable angina was identified using International Classification of Diseases, 9th Edition (ICD-9) codes (410,411), defining the study sample (those eligible for secondary prevention). Approval from the VA institutional review boards at Central Texas Veterans Health Care System and South Texas Veterans Health Care System was obtained before initiation of this study.

The dependent measure was prescription aspirin filled at a pharmacy (includes both incident aspirin use and potentially previous aspirin use) after the postoperative MI/unstable angina episode and extracted from VA pharmacy records. Fills for beta-blockers, angiotensin-converting-enzyme inhibitors, angiotensin II receptor blockers (ACEI/ARB) and statins were also determined to compare fill behavior on other cardioprotective drugs. Demographic measures were also obtained and included age at surgery, gender, race (African American, Asian/Native American and white), Hispanic ethnicity and marital status (single, married and widowed). Additionally, those categorized as "VA priority 1" were identified. VA priority 1 patients are 50% to 100% disabled by a military service-connected condition, and they are not required to submit a co-payment for prescription drugs.

Clinical covariates included severe mental illness (schizophrenia, bipolar disorder, posttraumatic stress disorder and major depression), which may be associated with poorer self-management and more prescriptions, medical conditions which may be associated with receipt of more prescriptions, smoking history and priority 1 veteran status. The database included information related to mental illness as part of the

STOPP study.[14] Although mental illness is not a traditional medical risk factor for CVD, depression has recently been recognized as a potential overlooked risk factor for CVD, and psychotic illnesses have long been associated with CVD related to lifestyle factors and antipsychotic side effects.[15–17] Medical conditions potentially related to getting prescription aspirin were identified using ICD-9 codes (diabetes, 250; hypertension, 401–405; dyslipidemia 272). Use of other antiplatelet/anticoagulants (clopidogrel, warfarin, aspirin/dipyridamole and dabigatran) both in the year before surgery and the year of postoperative follow-up was assessed from pharmacy fill data. Common contraindications to aspirin use (liver disease, alcohol use disorders and gout) were captured by the Selim physical index. Conditions that pose an increased risk of bleeding with aspirin use were identified using ICD-9 codes (peptic ulcer disease 530.XX, duodenal ulcer 532.XX, esophageal ulcer 530.20, intracranial hemorrhage 432.9, intracerebral hemorrhage 431 and subarachnoid hemorrhage 430).

Statistical Analyses

All patient characteristics were summarized for the 2 groups (prescription aspirin filled and prescription aspirin not filled) using frequency (percent). Multivariable logistic regression models estimated odds ratios (OR) of filling an aspirin prescription and 95% confidence intervals for the predictors of interest: age, gender, race, Hispanic ethnicity, VA priority 1, history of smoking, schizophrenia, bipolar disorder, posttraumatic stress disorder, major depression, dyslipidemia, hypertension, diabetes, Selim physical comorbidity score, use of additional antiplatelet agents/anticoagulants preoperatively, use of additional antiplatelet agents/anticoagulants postoperatively and bleed risk. Covariates were chosen to adjust for physiological and sociodemographic factors expected to influence the use of prescription aspirin. Models included an indicator for missing data on race to retain all cases. Sensitivity analyses omitting patients with missing race data resulted in similar estimated OR for the remaining predictors. An age-stratified analysis was performed to better examine aspirin prescriptions filled by women veterans. Logistic regression models estimate the strength of correlations with the outcome, adjusting for included covariates. All tests of significance were conducted at an alpha level of 0.05.

RESULTS

Prevalence of Aspirin Prescription Filled

Of 321,131 men and women veterans who underwent major surgery between the fiscal years 2005 and 2009, 7,700 experienced a postoperative MI or episode of unstable angina and had at least 1 prescription filled in the VA pharmacy (Figure 1). Among those with postoperative MI or unstable angina, 2,057 were VA priority 1 status and incurred no co-payments for prescriptions.

Characteristics of the veterans that had a postoperative MI or episode of unstable angina are summarized in Table 1. Only 47% of veterans who met criteria for having a postoperative MI or unstable angina filled an aspirin prescription. VA priority 1 veterans were more likely to have a prescription aspirin fill (59% vs 43% with co-pays, $P < 0.0001$). Overall, 40% of women veterans with an episode of postoperative MI or unstable angina filled an aspirin prescription, statistically equivalent to men's rate (47%; $P = 0.09$). Additionally, 55% of African American veterans and 54% of Asian/Native American veterans filled their aspirin prescription while only 46% of white veterans filled their prescription ($P < 0.0001$).

Predictors of Filling an Aspirin Prescription

The multivariate logistic regression model is summarized in Table 2. Among 7,700 patients with postoperative MI or unstable angina and valid race/ethnicity data, filling a prescription for aspirin was positively associated with younger age (less than 65 years), black race, Hispanic ethnicity, priority 1 (no co-pays for pharmacy), history of smoking, dyslipidemia, hypertension, posttraumatic stress disorder, major depression and postoperative
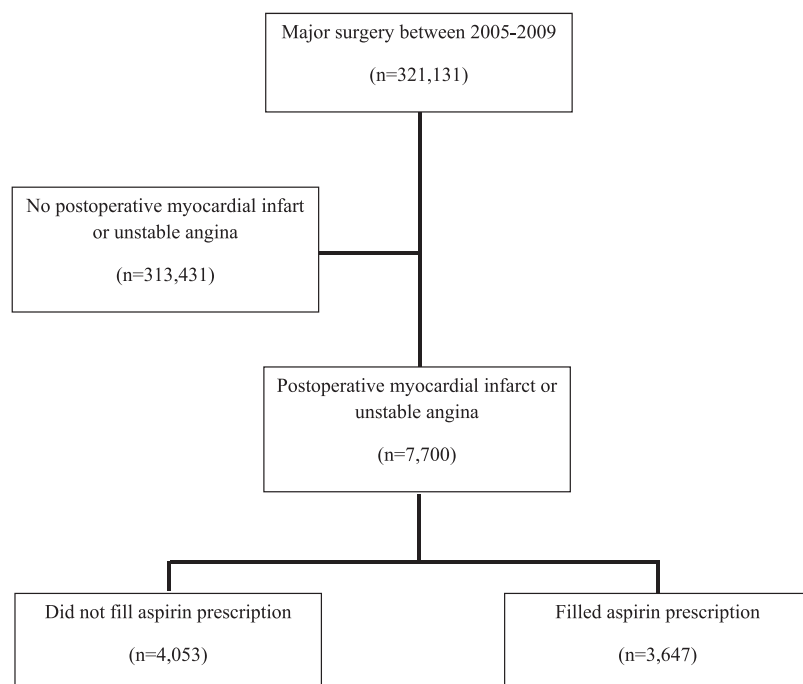

FIGURE 1. Flowchart of study participants.