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Practice Variation in Triple Therapy for Patients With Both Atrial Fibrillation and Coronary Artery Disease

Insights From the ACC's National Cardiovascular Data Registry

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ABSTRACT

OBJECTIVES The aim of this study was to test the hypothesis that in the United States substantial practice variation exists in triple therapy prescribing practices, unrelated to measured patient factors.

BACKGROUND Recent data have shown that the risk of bleeding on dual antiplatelet therapy and oral anticoagulation ("triple therapy") is high, although the optimal strategy for patients with atrial fibrillation and coronary artery disease remains unclear.

METHODS Using the PINNACLE (National Practice Innovation and Clinical Excellence) registry, we identified 79,875 unique patients with both atrial fibrillation/atrial flutter and myocardial infarction and/or coronary stenting within 12 months. Using triple therapy as a binary outcome variable, we created a mixed-effects logistic regression model with patient factors as fixed effects and practice site as a random effect. Patient factors included age, sex, diabetes, congestive heart failure, hypertension, peripheral arterial disease, prior stroke or transient ischemic attack, history of systemic embolization, and dyslipidemia. The model was assessed with a median odds ratio to assess practice variation after adjustment for patient factors.

RESULTS After adjustment for patient factors, significant practice variation was suggested by a median odds ratio of 2.78 (95% confidence interval: 2.33 to 3.23). In particular, this suggests that 2 randomly selected practices would differ in their likelihood of prescribing triple therapy for an identical patient by a factor of nearly 3.

CONCLUSIONS In the United States, there is substantial practice variation in prescribing triple therapy to eligible patients even after adjustment for patient clinical characteristics. These results suggest that opportunities exist to improve the quality of care of this sizable population. (J Am Coll Cardiol EP 2016;2:36–43)

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The management of patients with indications for both antiplatelet and anticoagulant therapy has generated controversy. For patients with a history of myocardial infarction (MI) within 1 year or percutaneous coronary intervention (PCI) within 1 month for bare metal stents and within 1 year for drug-eluting stents, dual antiplatelet therapy (DAPT) is indicated to reduce the risk of adverse thrombotic events, including MI and stent thrombosis (1). Many patients with MI and/or PCI also have atrial fibrillation (AF). Of populations referred for elective PCI, 5% to 10% are taking oral anticoagulation before PCI (2), generally because of AF.

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Current guidelines for these patients list triple oral antithrombotic therapy with aspirin, clopidogrel, and warfarin as a class IIb recommendation ("may be considered") (3), reflecting a lack of clinical consensus. Before the creation and widespread dissemination of risk scores, variance in prescription rates for oral anticoagulation in patients with AF correlated with physician specialty, with different specialties developing different risk estimates for cardioembolic stroke (4,5). Even after the publication of the CHADS (congestive heart failure, hypertension, age 75 years, diabetes mellitus, stroke) score (6), variation among different regions in the United States over and above patient characteristics has persisted (7). Trials evaluating triple therapy have either been underpowered for stent thrombosis (8) or suggested that 6 weeks and 6 months of triple therapy were equivalent (9). As such, the optimal strategy remains unclear. In these circumstances, providers may rely on anecdotes and local peer-practice patterns. Assessing relative contributions of provider versus patient characteristics in determining treatment decisions has the potential to provide insight into the potential of higher quality evidence, stronger guidelines, and/or the systematic incorporation of personalized risk calculators into clinical practice.

Given the mixed evidence for treatment of patients with MI or PCI who require anticoagulation for AF, we sought to assess current practice in the United States for these patients. In particular, we assessed risk-adjusted variation in patterns of care in data from the American College of Cardiology National Cardiovascular Data Registry's PINNACLE (National Practice Innovation and Clinical Excellence) program, a prospective registry of outpatient cardiac care (10).

METHODS

STUDY POPULATION. We examined patient encounters in outpatient cardiology practices in the United States from the American College of Cardiology's PINNACLE registry. PINNACLE is the first national, prospective, office-based quality improvement registry in the United States (10). This voluntary registry incorporates a variety of clinical data from outpatient visits, including symptoms, vital signs, comorbidities, medications, and recent hospitalizations.

We identified 9,538,255 patient encounters in data from the PINNACLE registry from 2008 to 2013. We included the most recent patient encounter and identified patients with both MI within 12 months and/or coronary stenting within 12 months and with AF/atrial flutter. With those criteria, 79,875 unique patients were identified for inclusion. A flow diagram, showing exclusions, appears in **Figure 1**.

OUTCOMES AND COVARIATES. For each patient, we recorded all antiplatelet (aspirin, clopidogrel, prasugrel, ticlopidine) and anticoagulant (warfarin, dabigatran, rivaroxaban, apixaban) medications taken by the patient at the time of the visit. We then created a binary outcome variable representing triple therapy. We defined triple therapy as aspirin, at least 1 $P2Y_{12}$ receptor inhibitor, and at least 1 oral anticoagulant.

For each patient encounter, we extracted data on patient characteristics, including age, sex, race (white, black, native Hawaiian, American Indian, Asian), ethnicity (Hispanic, not Hispanic), insurance status (private, Medicare fee-for-service, Medicare health maintenance organization, Medicaid, military, state, Indian Health Service, non-US, none), comorbidities (hypertension, systemic embolization, heart failure, prior heart failure encounter within 12 months, stable angina, dyslipidemia, peripheral arterial disease, diabetes, prior stroke or transient ischemic attack [TIA]), and provider designation (MD, NP, other).

STATISTICAL ANALYSIS. Using the binary outcome variable of triple therapy versus no triple therapy, we proceeded with logistic regression with 2 mixed-effects models. The first model, the empty model, contained only practice site as a random effect and no fixed effects. The second model, the adjusted model, treated patient variables as fixed effects and individual practice as a random effect. In choosing the fixed effects, we identified variables associated

ABBREVIATIONS AND ACRONYMS

AF = atrial fibrillation
DAPT = dual antiplatelet therapy
EHR = electronic health record
MI = myocardial infarction
MOR = median odds ratio
PCI = percutaneous coronary intervention
TIA = transient ischemic attack