JACC: ADVANCES VOL. 3, NO. 10, 2024

Letters

RESEARCH LETTER

Disparities in Prescription Patterns of Cardioprotective Medications in Postacute Myocardial Infarction Patients in Indiana

Cardiovascular disease remains the leading cause of mortality globally, with acute myocardial infarction (AMI) being a key contributor.[1] Appropriate pharmacotherapy during and immediately after AMI can significantly reduce the risk of subsequent cardiovascular events and mortality.[2] Prior research has shown disparities in prescription patterns of some cardioprotective drugs based on race and ethnicity in general patient populations,[3] yet disparities in drug regimens in the post-myocardial infarction (MI) period have not been explored. This study sought to conduct a comprehensive investigation of potential disparities in post-AMI prescription patterns to contribute to ongoing efforts to optimize cardiovascular clinical outcomes and equity.

Patients who presented with AMI (ie, presenting with ST-segment elevation MI and who received percutaneous coronary intervention) at 7 hospitals in a single health system in Indiana between 2009 and 2022 were included in the analysis. Data were extracted from the health system-wide electronic health record data submitted to the National Cardiovascular Data Registry. We used multivariable logistic regression for dichotomous prescription outcomes and multivariable Poisson regression for the medication count outcome variable to determine the relationship between patient demographic characteristics including sex, age, self-reported race, and self-reported ethnicity, and prescription of medications including aspirin, angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), beta-blockers, statin, clopidogrel, prasugrel, and ticagrelor. For each regression, we used complete case analysis with the following covariates, each of which had at least 95% complete data: AMI risk factors (cerebrovascular disease, diabetes, hypertension, dyslipidemia, prior MI, prior percutaneous coronary intervention, prior coronary artery bypass graft, and peripheral arterial disease); comorbidities (chronic lung disease and dialysis); body mass index; and the other demographic variables. We conducted a series of sensitivity analyses using multiple imputation to determine the impact of missingness. Associations are summarized using an adjusted OR (95% CI). A level of significance of 0.05 was used for all hypothesis testing. The current study was deemed exempt from the Franciscan Health Institutional Review Board approval.

Of 8,348 patients, 5,871 (70.3%) were male, 7,651 (91.6%) were White, 524 (6.2%) were Black/African American, 103 (1.3%) were Hispanic/Latino, and the median age was 60 (range: 22-99). Our multivariable analysis using complete case analysis revealed several significant demographic disparities in prescription medications. ACE inhibitors, statins, prasugrel, and overall number of prescriptions were higher in men compared with women. ARBs and clopidogrel prescriptions were higher with increasing age, but aspirin, ACE inhibitors, beta-blockers, statins, prasugrel, and overall number of prescriptions decreased with increasing age. Among Asian patients, ACE inhibitors were less likely to be prescribed, and ARBs were more likely to be prescribed due to increased prescription of sacubitril-valsartan. Statins were less likely to be prescribed among White patients. No other significant disparities in prescription patterns were found by race or ethnicity (**Table 1**). Under sensitivity analysis with multiple imputation, the association of prasugrel and number of prescriptions with gender as well as statin prescription with White race were no longer statistically significant. All other findings remained consistent.

The results of this study highlight notable demographic disparities in the prescription patterns for post-AMI medications in patients in Indiana. The significantly higher odds of statin prescription among

ISSN 2772-963X https://doi.org/10.1016/j.jacadv.2024.101237

TABLE 1 Analysis of Associations Between Demographics and Medications

	Male (n = 5,871)	White (n = 7,651)	Black/AA (n = 524)	Asian (n = 78)	American Indian/ Alaskan Native (n = 18)	Hispanic or Latino (n = 103)	Age
ACE inhibitor	1.32 (1.18-1.47)***	1.11 (0.93-1.32)	0.98 (0.80-1.20)	0.56 (0.34-0.91)*	3.32 (1.09-14.39)	0.65 (0.41-1.01)	0.983 (0.979-0.987)***
Aspirin	1.31 (0.96-1.78)	0.90 (0.48-1.55)	1.16 (0.63-2.38)	0.74 (0.23-4.58)	0.36 (0.07-6.59)	0.43 (0.17-1.45)	0.971 (0.958-0.983)***
ARB	0.95 (0.82-1.12)	0.81 (0.64-1.05)	1.17 (0.87-1.54)	2.13 (1.12-3.81)*	-	0.68 (0.26-1.46)	1.022 (1.016-1.028)***
Beta blocker	1.11 (0.90-1.37)	1.27 (0.90-1.77)	0.91 (0.62-1.40)	0.67 (0.31-1.75)	0.33 (0.11-1.43)	1.38 (0.57-4.55)	0.982 (0.974-0.990)***
Statin	1.78 (1.29-2.46)***	0.30 (0.09-0.72)*	2.58 (1.07-8.48)	-	-	1.73 (0.37-30.65)	0.973 (0.960-0.986)***
Clopidogrel	0.93 (0.84-1.04)	1.04 (0.87-1.24)	1.03 (0.84-1.26)	1.14 (0.69-1.86)	0.83 (0.30-2.12)	1.08 (0.69-1.68)	1.014 (1.010-1.018)***
Prasugrel	1.19 (1.02-1.39)*	0.87 (0.69-1.09)	1.20 (0.92-1.54)	0.87 (0.41-1.67)	0.60 (0.09-2.16)	1.09 (0.60-1.86)	0.966 (0.961-0.972)***
Ticagrelor	1.00 (0.90-1.13)	0.95 (0.78-1.15)	0.97 (0.78-1.21)	0.90 (0.52-1.52)	2.07 (0.71-6.76)	0.79 (0.48-1.29)	1.001 (0.996-1.005)
Med count	1.03 (1.00-1.05)*	1.00 (0.96-1.05)	1.01 (0.96-1.05)	0.97 (0.86-1.09)	1.10 (0.88-1.35)	0.98 (0.88-1.09)	0.997 (0.996-0.998)***

Values are adjusted OR (95% CI). The symbol-indicates not enough data to perform the regression. Significance level: *0.05, **0.01, ***0.001.
AA = African American; ACE = angiotensin-converting enzyme; ARB = angiotensin receptor blocker.

men compared with women is particularly surprising, considering the established efficacy of statins in reducing subsequent cardiovascular events and mortality in post-AMI patients. Further, reduced statin, ACE inhibitor, and overall prescriptions are consistent with prior published literature indicating that women often receive less aggressive treatment in acute cardiovascular diseases.[4] Ethnic disparities in ACE inhibitors/ARB prescriptions among Asian patients could indicate a difference in the side effect profile of these medications.[5] The age-related disparities likely reflect concerns about the risk-benefit tradeoffs of these medications in older populations; however, it is to be noted that the lower prescription of prasugrel with increasing age could reflect current recommendations rather than disparity.

Despite limitations including limited generalizability and potential bias due to its single health system, treatment of individual medication prescription patterns as independent, retrospective nature, and lack of potentially important confounders (eg, insurance status and income level), our study provides important insights into demographic disparities in the prescription of cardioprotective medications post-AMI in Indiana. Future research should explore the underlying causes of these disparities and evaluate the effectiveness of targeted policy interventions to ensure equitable post-AMI care across all demographic groups.

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This work was funded in part by NIH/NHLBI (HL133407, HL136578, and HL147133 [to Dr Dharmakumar]). The authors have reported that they have no relationships relevant to the contents of this paper to disclose.
The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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