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ORIGINAL RESEARCH

In-Hospital Outcomes of Acute Myocardial Infarction With Essential Thrombocythemia and Polycythemia Vera: Insights From the National Inpatient Sample

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BACKGROUND: Acute myocardial infarction (AMI) with essential thrombocythemia (ET) or polycythemia vera is rare, and there are scarce real-world data on its management and impact on in-hospital outcomes.

METHODS AND RESULTS: Dates of current retrospective cohort study were obtained from the US National Inpatient Sample from October 2015 to 2019 for hospitalizations with AMI. The primary outcome was in-hospital mortality, and the secondary outcome was major adverse cardiac or cerebrovascular events, stroke, and bleeding; major adverse cardiac or cerebrovascular event was defined by a composite of all-cause mortality, stroke, and cardiac complications. Of the 2 871 934 weighted AMI hospitalizations, 0.27% were with ET and 0.1% were with polycythemia vera. Before propensity matching, AMI hospitalization with ET was associated with increased risk of in-hospital mortality (7.1% versus 5.7%; odds ratio [OR], 1.14 [95% CI, 1.04–1.24]), major adverse cardiac or cerebrovascular events (12.6% versus 9%; OR, 1.36 [95% CI, 1.26–1.45]), bleeding (12.7% versus 5.8%; OR, 2.28 [95% CI, 2.13–2.44]), and stroke (3.1% versus 1.8%; OR, 1.66 [95% CI, 1.46–1.89]). Polycythemia vera was associated with an increased risk of in-hospital mortality (7.8% versus 5.7%; OR, 1.21 [95% CI, 1.04–1.39]) and major adverse cardiac or cerebrovascular events (12.0% versus 9%; OR, 1.18 [95% CI, 1.05–1.33]). After propensity matching, ET was associated with increased risk of bleeding (12.6% versus 6.1%; OR, 2.22 [95% CI, 1.70–2.90]), and AMI with polycythemia vera was not associated with worse in-hospital outcomes.

CONCLUSIONS: AMI hospitalization with ET is associated with high bleeding risk before and after propensity score matching, particularly for hospitalizations treated with percutaneous coronary intervention. The management of AMI requires a multidisciplinary and patient-centered approach to ensure safety and improve outcomes.

Key Words: acute myocardial infarction ■ bleeding ■ essential thrombocythemia ■ in-hospital mortality ■ polycythemia vera

Essential thrombocythemia (ET) and polycythemia vera (PV) are chronic Philadelphia-negative myeloproliferative neoplasms. ET is characterized by clonal thrombocytosis, and PV is characterized by clonal erythrocytosis.[1] The reported prevalence of ET is 38 to 57 cases per 100 000 people,[2] with a similar prevalence of PV.[3] The survival of patients with ET or PV is only slightly worse than that of age- and sex-adjusted healthy participants; the median survival of patients with ET or PV is 15 to 18 years, and 35 to 37 years for patients aged ≤40 years.[1,4]

Previous studies have indicated that ET and PV are associated with an increased risk of thrombosis.[5] Thrombosis events are a major cause of morbidity and mortality in patients with ET and PV.[6–8] The thrombotic risk is more evident for the patients aged >60 years;

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CLINICAL PERSPECTIVE

What Is New?

- Before propensity matching, acute myocardial infarction hospitalization with essential thrombocythemia was associated with increased risk of in-hospital mortality (7.1% versus 5.7%), major adverse cardiac or cerebrovascular events (12.6% versus 9%), bleeding (12.7% versus 5.8%), and stroke (3.1% versus 1.8%); even after propensity matching, essential thrombocythemia was associated with increased risk of bleeding (12.6% versus 6.1%).
- Before propensity matching, acute myocardial infarction hospitalization with polycythemia vera was associated with an increased risk of in-hospital mortality (7.8% versus 5.7%) and major adverse cardiac or cerebrovascular events (12.0% versus 9%); after propensity matching, polycythemia vera was not associated with worse in-hospital outcomes.

What Are the Clinical Implications?

- Acute myocardial infarction hospitalization with essential thrombocythemia is associated with high bleeding risk before and after propensity score matching, particularly for hospitalizations treated with percutaneous coronary intervention.
- The management of acute myocardial infarction with essential thrombocythemia or polycythemia vera requires a multidisciplinary and patient-centered approach to ensure safety and improve outcomes.

Nonstandard Abbreviations and Acronyms

ET	essential thrombocythemia
MACCE	major adverse cardiac or cerebrovascular event
NIS	National Inpatient Sample
PSM	propensity score matching
PV	polycythemia vera

therefore, conventional thrombotic risk stratifies patients aged >60 years or with a history of thrombosis as high risk.[2] Classic atherosclerosis risk factors, such as hypertension, diabetes, obesity, and dyslipidemia, are common in this population, and increase the risk of a thrombotic event.[9] Acute myocardial infarction (AMI), including ST-segment–elevation myocardial infarction (STEMI) and non–ST-segment–elevation myocardial infarction (NSTEMI), is a common complication of ET and PV. Optimal management of AMI is crucial for the proper care of this unique population. In the meantime, ET is associated with acquired von Willebrand disease, which increases the risk of bleeding.[1,10,11]

AMI treatment involves systemic antithrombotic and anticoagulation therapy, especially for patients treated with percutaneous coronary intervention (PCI). As standard practice, heparin or other anticoagulation is used to achieve optimal activated clotting time. Bleeding-prone ET and PV may expose patients to excessive risk of bleeding.[12] However, because of the rarity of these conditions, there are limited data on their prevalence, management strategies, and impact on in-hospital outcomes.

METHODS

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Study Design and Participants

The National Inpatient Sample (NIS) database was developed by the Agency for Healthcare Research and Quality (Healthcare Cost and Utilization Project). It is the largest inpatient database in the United States and includes data on about 7 million unweighted hospitalizations annually, with >100 clinical and nonclinical data elements. The national estimate can be established using the discharge weight variable provided by the Healthcare Cost and Utilization Project. In this study, the *International Classification of Diseases, Tenth Revision, Clinical Modification* (*ICD-10-CM*), coding was used to identify the study populations, and the Healthcare Cost and Utilization Project–provided Elixhauser Comorbidity Software Refined for *ICD-10-CM* was used to identify comorbidities. The use of the NIS database to describe the prevalence and outcomes of cardiovascular disease has been previously validated.[13,14] The NIS database is a publicly available and deidentified database; for this reason, Institutional Review Board approval and informed consent were waived. The authors vouch for the accuracy and completeness of the data.

STEMI hospitalizations were identified using the *ICD-10-CM* diagnosis codes I21.0x, I21.1x, I21.2x, and I21.3; NSTEMI hospitalizations were identified using the *ICD-10-CM* diagnosis code I21.3; and ET and PV were identified using the *ICD-10-CM* diagnosis codes D47.3 and D45[15–17] (Table S1). All STEMI hospitalizations were included in this study, and only NSTEMI diagnoses coded as the primary diagnosis were included to reduce the heterogeneity of the population with NSTEMI. Patients aged <18 years at hospital admission and with missing data on in-hospital mortality were excluded (Figure 1). The prevalence of ET and PV with AMI was

analyzed, the primary outcome was in-hospital mortality, and the secondary outcome was major adverse cardiac or cerebrovascular events (MACCEs), defined by a composite of all-cause mortality, stroke, and cardiac complications (hemopericardium and cardiac tamponade necessitating pericardiocentesis), stroke, and bleeding (hemorrhagic stroke, gastrointestinal bleeding, and blood transfusion). Total charges were merged with cost/charge ratio files to calculate hospital costs.

Statistical Analysis

Because of the skewed nature of the NIS data, all continuous variables are expressed as numbers and first and third quartiles. Categorical variables are expressed as percentages. Discharge weights were applied for the national estimates, as recommended by the Healthcare Cost and Utilization Project for the use of the NIS data set. Multivariable logistic regression was used to evaluate the impact of ET and PV on the in-hospital outcomes, and data are reported as odds ratios (ORs) with a 95% CI. Variables included in the model were age, sex, race, hypertension, diabetes, obesity, smoking status, atrial fibrillation, prior stroke, prior PCI, prior myocardial infarction, prior coronary artery bypass grafting, chronic lung disease, peripheral arterial disease, family history of coronary artery disease, STEMI presentation, hypothyroidism, autoimmune disease, and dementia. Differences between categorical variables were evaluated using the χ^2 test, and differences between continuous variables were assessed using the Mann-Whitney *U* test; the corresponding ORs and 95% CIs are presented as forest plots. Propensity score matching (PSM) was deployed to balance the baseline difference between the hospitalizations with ET and PV. The propensity score was calculated for each patient on the basis of a logistic regression analysis of the probability of with ET or PV, using age, sex, race, hypertension, diabetes, obesity, smoking status, atrial fibrillation, prior stroke, prior PCI, prior myocardial infarction, prior coronary artery bypass grafting, chronic lung disease, peripheral arterial disease, family history of coronary artery disease, STEMI presentation, hypothyroidism, autoimmune disease, dementia, and PCI. A greedy matching algorithm was used to match patients on the logit of the propensity score with a caliper width of 0.2 of the SD of the logit of the propensity score. SAS Psmatch procedure was used for the PSM, and SAS 9.4 (SAS Institute, Cary, NC) was used for PSM and all analyses.

RESULTS

The study flowchart is shown in Figure 1. We identified 810 620 unweighted AMI hospitalizations in the NIS database from October 2015 to 2019, after exclusion of the patients aged <18 years at admission (n=123), with missing data on in-hospital mortality (n=395), and with an NSTEMI diagnosis code that was not in the primary diagnosis position (n=235 752). There were 574 350 hospitalizations in the final cohort, including 572 314 (99.64%) hospitalizations without an ET or PV

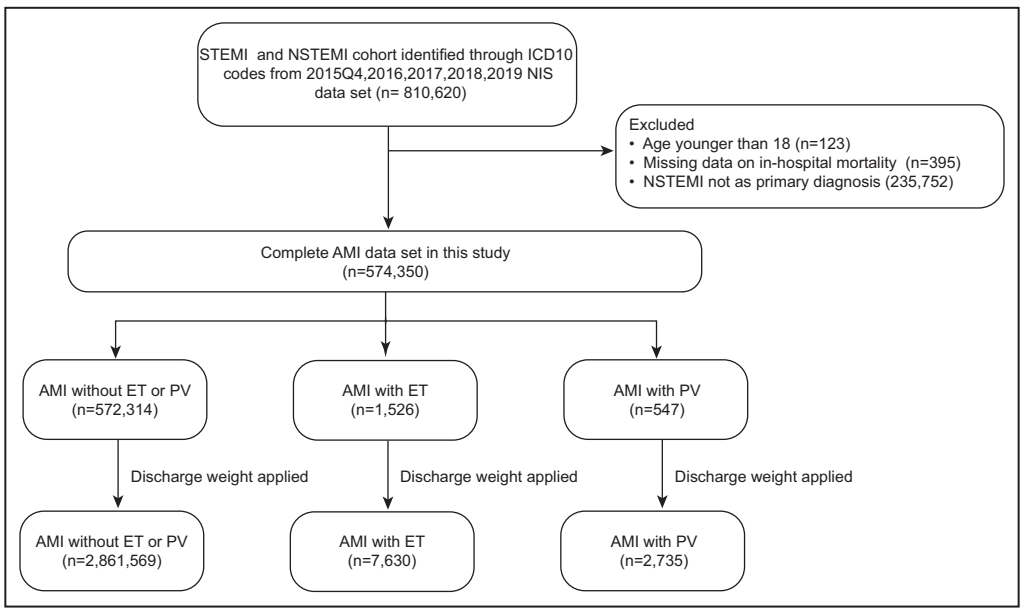

Figure 1. Study flowchart.
AMI indicates acute myocardial infarction; ET, essential thrombocythemia; *ICD-10*, *International Classification of Diseases, Tenth Revision*; NIS, National Inpatient Sample; NSTEMI, non–ST-segment–elevation myocardial infarction; PV, polycythemia vera; Q, quartile; and STEMI, ST-segment–elevation myocardial infarction.

Table 1. Baseline Demographic and Hospital Characteristics

Variables	AMI with no ET or PV (unweighted=572 314; weighted=2 861 569)	ET (unweighted=1526; weighted=7630)	PV (unweighted=547; weighted=2735)
Age, y	67 (57–77)	67 (57–78)	70 (59–80)
Female sex	37.6	47.6	32.4
STEMI	31.7	39.4	32.6
Race or ethnicity			
White	73.7	73.3	84.6
Black	11.3	11.1	5.5
Hispanic	8.7	7.3	5.3
Asian/Pacific Islander	2.8	2.7	1.4
Native American	0.6	0.5	0.8
Other races	3.0	3.1	2.4
Hypertension	80.9	78.2	83.9
Diabetes	40.5	33.0	27.3
Atrial fibrillation	19.4	19.7	22.9
History of smoking	29.3	30.6	31.2
Obesity	19.5	16.1	20.4
Prior MI	15.8	14.1	16.9
Prior PCI	17.7	14.9	15.1
Prior CABG	10.0	8.2	6.7
Prior stroke	7.9	8.2	9.0
Peripheral arterial disease	11.3	16.4	18.4
Chronic lung disease	21.5	27.3	29.4
Hypothyroidism	12.3	14.3	15.3
Autoimmune conditions	2.8	4.0	3.5
Dementia	5.6	7.5	4.5
Family history of CAD	14.1	12.4	12.6
Hospital size (number of beds)			
Small	17.6	16.7	11.2
Medium	30.4	31.0	29.4
Large	52.1	52.3	59.4
Hospital location/teaching status			
Rural hospital	7.7	6.9	9.6
Urban nonteaching hospital	23.1	22.3	22.0
Urban teaching hospital	69.2	70.9	68.4
Payer			
Medicare	57.3	58.1	62.9
Medicaid	9.4	11.0	8.3
Private	25.4	23.7	25.5
Self-pay	4.6	4.1	1.8
No charge	0.4	0.2	0.2
Other*	2.8	3.0	1.4
Angiography	71.2	63.4	72.6
PCI	47.8	36.7	46.5
CABG	8.7	10.6	8.2
Systemic thrombolysis	1.1	1.3	1.0
Thrombectomy	4.8	5.3	6.7

(*Continued*)

Table 1. Continued

Variables	AMI with no ET or PV (unweighted=572 314; weighted=2 861 569)	ET (unweighted=1526; weighted=7630)	PV (unweighted=547; weighted=2735)
MCS	5.3	7.5	6.7
Cardiogenic shock	6.8	10.3	9.0
Cost of care, $	16 666 (9659–26 868)	18 691 (10 385–35 617)	17 957 (10 494–30 137)
Length of hospital stay, d	3 (2–5)	4 (2–10)	3 (2–7)

Values are percentage or median (interquartile range). AMI indicates acute myocardial infarction; CABG, coronary artery bypass grafting; CAD, coronary artery disease; ET, essential thrombocythemia; MCS, mechanical circulatory support; MI, myocardial infarction; PCI, percutaneous coronary intervention; PV, polycythemia vera; and STEMI, ST-segment–elevation MI.

*Race other than White, Black, Hispanic, Asian or Pacific Islander, and Native American categorized into other races.

diagnosis, 1526 (0.27%) AMI hospitalization with an ET diagnosis, and 547 (0.1%) AMI hospitalizations with a PV diagnosis (Figure S1). After applying discharge weight, this represented 2 861 569 AMI hospitalizations without ET or PV, 7630 AMI hospitalizations with ET, and 2735 AMI hospitalizations with PV nationwide.

The age of hospitalizations with AMI and a diagnosis of ET was similar to those with AMI without ET or PV (median age, 67 years [interquartile range {IQR}, 57–77 years] versus median age, 67 years [IQR, 57–78 years]), but there were more female patients (47.6% versus 37.6%), fewer patients with diabetes (33% versus 40.5%), obesity (16.1% versus 19.5%), and hypertension (78.2% versus 80.9%), more patients who presented with STEMI (39.4% versus 31.7%), and more patients with frequently comorbid peripheral arterial disease (16.4% versus 11.3%) and chronic lung disease (27.3% versus 21.5%). Compared with patients with AMI without ET or PV, patients with hospitalizations with AMI and a diagnosis of PV were older (median age, 70 years [IQR, 59–80 years] versus median age, 67 years [IQR, 57–77 years]), fewer were female sex (32.4% versus 37.6%), and fewer had diabetes (27.3% versus 40.5%). However, more were White race (84.6% versus 73.7%), with hypertension (83.9% versus 80.9%), atrial fibrillation (22.9% versus 19.4%), prior stroke (9% versus 7.9%), peripheral arterial disease (18.4% versus 11.3%), and chronic lung disease (29.4% versus 21.5%) (Table 1).

Compared with patients with hospitalizations without ET or PV, patients with hospitalizations with ET were more likely to have received conservative treatment (52.5% versus 43.5%) and less likely to have undergone coronary angiography (63.4% versus 71.2%) or PCI (36.9% versus 47.8%). Despite comparable percentages of patients with hospitalizations with PV who underwent angiography (72.6% versus 71.2%) compared with patients with hospitalizations without ET or PV, they were less likely to have undergone PCI (46.4% versus 47.8%) (Figure 2).

Patients with hospitalizations with ET were more likely to develop cardiogenic shock (10.3% versus 6.8%), to incur a higher medical cost (median, $18 691 [IQR, $10 385–$35 617] versus median, $16 666 [IQR, $9659–$26 868]), and to have a longer hospital stay (median, 4 days [IQR, 1–9 days] versus median, 3 days [IQR, 2–5 days]) (Table 1). Patients with hospitalizations with ET had a higher in-hospital mortality (7.1% versus 5.7%; OR, 1.14 [95% CI, 1.04–1.24]), higher MACCE rate (12.6% versus 9%; OR, 1.36 [95% CI, 1.26–1.45]), more stroke events (3.1% versus 1.8%; OR, 1.66 [95% CI, 1.46–1.89]), and more bleeding (12.7% versus 5.8%; OR, 2.28 [95% CI, 2.13–2.44]).

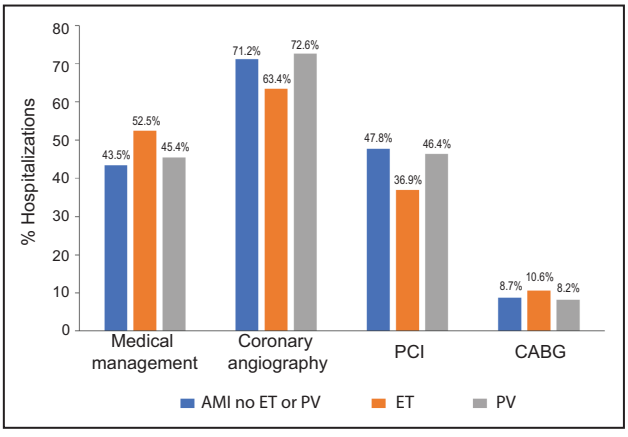

Figure 2. Treatment distribution for AMI hospitalizations with or without ET and PV.
AMI indicates acute myocardial infarction; CABG, coronary artery bypass grafting; ET, essential thrombocythemia; PCI, percutaneous coronary intervention; and PV, polycythemia vera.

Table 2. In-Hospital Outcomes for All AMI Hospitalizations

Outcome	AMI with no ET or PV (unweighted = 572 314; weighted = 2 861 569)	ET (unweighted = 1526; weighted = 7630)	PV (unweighted = 547; weighted = 2735)
In-hospital mortality	5.7	7.1	7.8
MACCE	9.0	12.6	12.0
Bleeding	5.8	12.7	6.5
Stroke	1.8	3.1	2.2

Data are given as percentage. Cardiac complication: hemopericardium and cardiac tamponade needs for pericardiocentesis. Bleeding: gastrointestinal, intracranial, or cerebral bleeding, or blood transfusion. AMI indicates acute myocardial infarction; ET, essential thrombocythemia; MACCE, major adverse cardiac or cerebrovascular event; and PV, polycythemia vera.

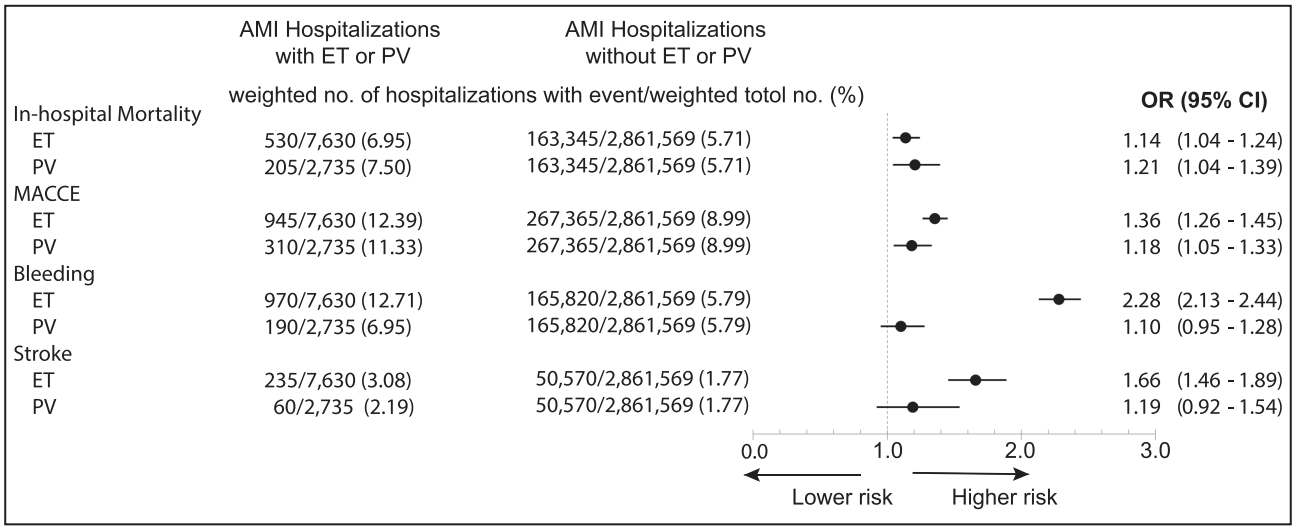

Figure 3. Forest plot of multivariable regression analysis to predict in-hospital outcomes in overall AMI.
AMI indicates acute myocardial infarction; ET, essential thrombocythemia; MACCE, major adverse cardiac or cerebrovascular event; OR, odds ratio; and PV, polycythemia vera.

Compared with patients with hospitalizations without ET or PV, patients with hospitalizations with PV had higher in-hospital mortality (7.8% versus 5.7%; OR, 1.21 [95% CI, 1.04–1.39]) and MACCEs (12% versus 9%; OR, 1.18 [95% CI, 1.05–1.33]) but not bleeding (6.5% versus 5.8%; OR, 1.10 [95% CI, 0.95–1.28]) or stroke (2.2% versus 1.8%; OR, 1.19 [95% CI, 0.92–1.54]) (Table 2 and Figure 3). Subgroup analysis revealed that

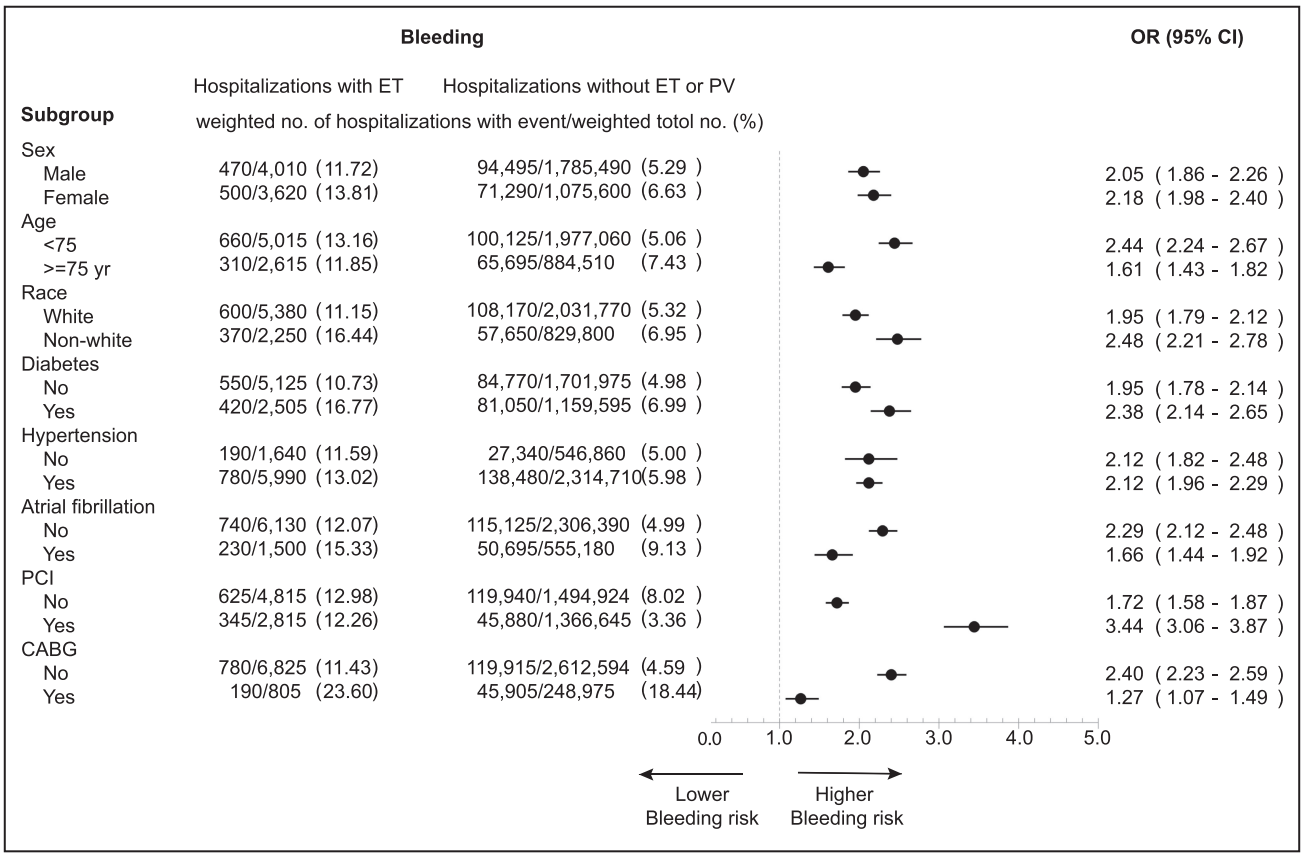

Figure 4. Subgroup analysis of bleeding for acute myocardial infarction hospitalization with ET.
CABG indicates coronary artery bypass grafting; ET, essential thrombocythemia; OR, odds ratio; PCI, percutaneous coronary intervention; and PV, polycythemia vera.

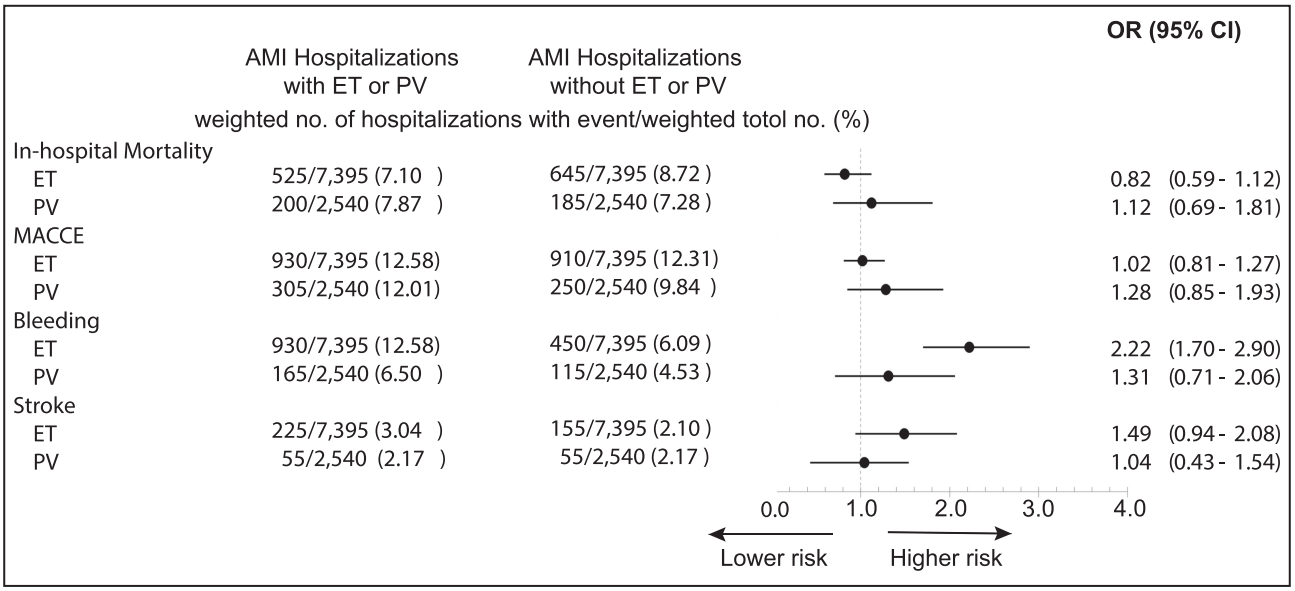

Figure 5. Forest plot of multivariable regression analysis to predict in-hospital outcomes in propensity score–matched hospitalizations.
AMI indicates acute myocardial infarction; ET, essential thrombocythemia; MACCE, major adverse cardiac or cerebrovascular event; OR, odds ratio; and PV, polycythemia vera.

an AMI hospitalization with ET was consistently associated with high bleeding risk across all subgroups. PCI was associated with the highest bleeding risk, with a >3-fold increased risk in bleeding (3.44 [95% CI, 3.06–3.87]; Figure 4). Other subgroup analysis results are shown in Figures S2–S8.PSM well balanced the baseline variables, with all the standardized mean differences <0.1 (Figures S9 and S10). After PSM matching, hospitalization with ET was not associated with increased in-hospital mortality, MACCEs, or stroke but was still associated with an increased risk of bleeding. After PSM matching, hospitalization with PV was not associated with an increased risk of in-hospital mortality, MACCEs, stroke, or bleeding (Figure 5).

DISCUSSION

To the best of our knowledge, this study represents the largest sample-size analysis of data on hospitalizations of patients with AMI with ET and PV. The present study clarifies knowledge about the prevalence of ET or PV in AMI and their impact on in-hospital outcomes. Our work provides real-world evidence of the high bleeding risk associated with hospitalized patients with AMI and ET, particularly in those who have undergone PCI.

Our results revealed that AMI occurs at a similar age for hospitalizations with ET and those without ET or PV. However, classic risk factors for atherosclerosis[18] were less prevalent in AMI hospitalizations with ET, given that more patients were women, fewer patients had diabetes, obesity, and hypertension, and patients more frequently presented with STEMI. This indicates that an ET-associated thrombotic risk,[19] such as the formation of in situ coronary thrombosis lesions, may be a pathological cause of AMI.[20]

Emergent angiography followed by PCI is crucial in improving the prognosis of AMI.[21] However, hospitalizations with AMI and ET were less likely to receive angiography and subsequent PCI treatment. Bleeding risk concern[22] could be attributed to the less invasive treatment for patients with ET. Indeed, our analysis showed a significant risk of bleeding compared with hospitalizations without ET. After PSM, the in-hospital mortality, MACCE, and stroke event frequencies were similar for hospitalizations with and without ET; however, AMI hospitalization with ET was still associated with a high risk of bleeding, and the bleeding risk was significant across all subgroups. Bleeding risk was strikingly high for hospitalizations of patients who underwent PCI. For most AMI hospitalizations with ET, timely revascularization treatment may be beneficial; however, considering the significant bleeding risk, particularly for patients who underwent PCI, revascularization decisions should be individualized. Furthermore, the optimal anticoagulation and antithrombotic protocol for treatment for AMI hospitalization with ET requires further exploration.

Patients with hospitalizations with PV were older than those without ET or PV. After PSM, the in-hospital outcome of patients with PV was similar to those without ET or PV. Moreover, hospitalization with PV was not associated with an increased risk of bleeding. The differential impact of in-hospital mortality between

hospitalizations with ET and PV indicates that their unique pathologic characteristics may require individualized management.

For patients with AMI with ET or PV who undergo PCI, more stringent use of a stent should be considered. Intravascular imaging should be deployed in patients with AMI and ET to investigate the lesion cause. For example, in the absence of atherosclerotic lesions, a patient is less likely to benefit from stent implantation and might instead expose himself/herself to excessive risk of stent thrombosis.[23] Therefore, flow recovery should be the main goal of coronary intervention, and stent implantation should be reserved for lesions with significant atherosclerosis plaque burden or significant lumen residual stenosis.

Limitations

The present study has some limitations that should be noted. The administrative database lacked clinical details, such as medication, biochemistry, and imaging data. Moreover, for those who underwent PCI, the angiographic and procedural details were not available, and there were no long-term follow-up data in the NIS data set. Coding errors and underreporting of secondary diagnoses are also potential sources of bias. In addition, as with all retrospective observational studies, selection bias is inevitable. However, the NIS database has been extensively validated in previous publications.[24] This study included the largest sample of hospitalized patients with an ET or PV diagnosis, robust analyses were performed before and after propensity score matching, and subgroup analyses were included.

CONCLUSIONS

AMI hospitalization with ET is associated with high bleeding risk before and after PSM, particularly for hospitalized patients treated with PCI. In-hospital outcomes were similar after propensity matching. The management of AMI with ET or PV is challenging and requires a multidisciplinary and patient-centered approach to ensure safety and improve outcomes.

ARTICLE INFORMATION

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Disclosures

None.

Supplemental Material

Table S1
Figures S1–S10

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SUPPLEMENTAL MATERIAL

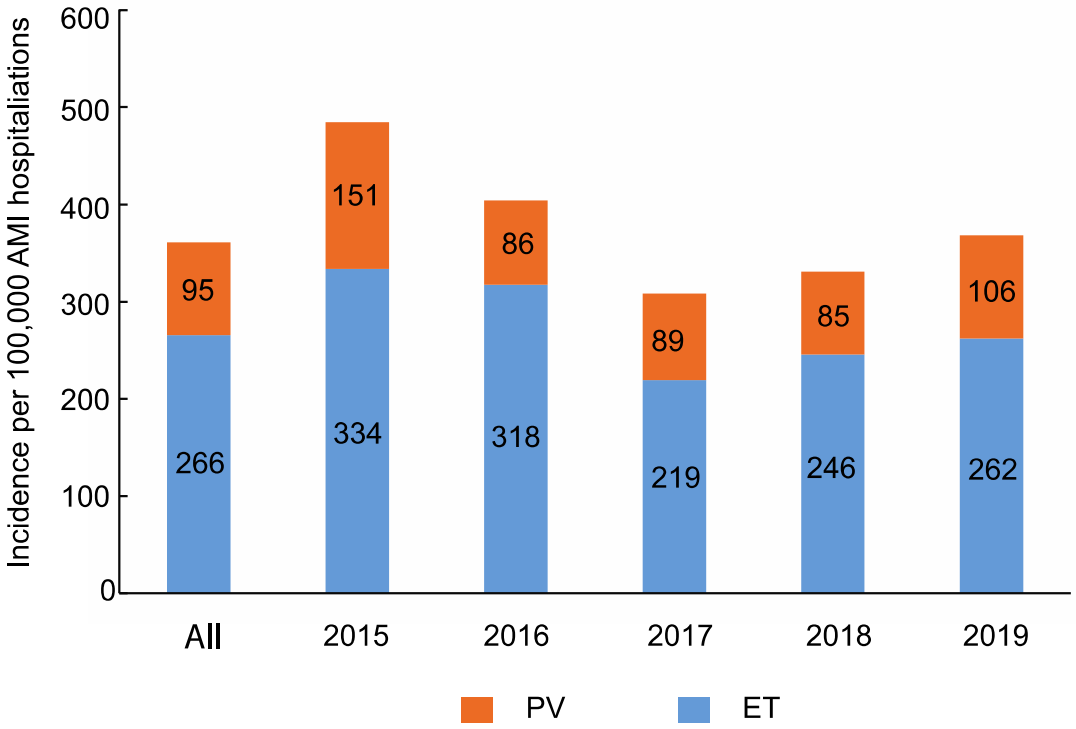
Table S1. ICD 10 diagnosis and procedure codes used in the study

Anterior STEMI I21.01 I21.02 I21.09
Inferior STEMI I21.11 I21.19
Unspecified STEMI I21.21 I21.29 I21.3
Smoking status Z87.891 F17.200 F17.201 F17.203 F17.208 F17.209 F17.210 F17.211 F17.213 F17.218 F17.219 F17.220 F17.221 F17.223 F17.228 F17.229 F17.290 F17.291 F17.293 F17.298 F17.299 Z72.0
Previous MI I25.2
Previous PCI Z98.61 Z95.5
Previous CABG Z95.1
Family history of CAD Z82.49 Z82.41
Previous Stroke Z86.73
Right heart angiography B2040ZZ B2041ZZ B204YZZ B2140ZZ B2141ZZ B214YZZ
Left heart angiography B2050ZZ B2051ZZ B205YZZ B2150ZZ B2151ZZ B215YZZ
Right and Left heart angiography B2060ZZ B2061ZZ B206YZZ B2160ZZ B2161ZZ B216YZZ B2000ZZ B2001ZZ B200YZZ B2010ZZ B2011ZZ B201YZZ B2100ZZ B2101ZZ B210YZZ B2110ZZ B2111ZZ B211YZZ 4A023N7 4A023N8
PCI procedure 0210344 02103D4 0211344 02113D4 02123D4 0270346 027034Z 0270356 027035Z 0270366 027036Z 0270376 027037Z 02703D6 02703DZ 02703E6 02703EZ 02703F6 02703FZ 02703G6 02703GZ 02703T6 02703TZ 02703Z6 02703ZZ 0271346 027134Z 0271356 027135Z 0271366 027136Z 0271376 027137Z 02713D6 02713DZ 02713E6 02713EZ 02713F6 02713FZ 02713G6 02713GZ 02713T6 02713TZ 02713Z6 02713ZZ 0272346 027234Z 0272356 027235Z 0272366 027236Z 0272376 027237Z 02723D6 02723DZ 02723EZ 02723F6 02723FZ 02723G6 02723GZ 02723TZ 02723Z6 02723ZZ 0273346 027334Z 0273356 027335Z 0273366 027336Z 0273376 027337Z 02733D6 02733DZ 02733EZ 02733FZ 02733GZ 02733Z6 02733ZZ 02C03Z6 02C03ZZ 02C13Z6 02C13ZZ 02C23Z6 02C23ZZ 02C33Z6 02C33ZZ 02H03DZ 02H13DZ 02H23DZ 02Q03ZZ 02Q13ZZ 02Q23ZZ 02U03JZ 02U13JZ X2C0361 X2C1361 X2C2361 X2C3361
Cardiogenic shock

R57.0
Hemopericardium I31.2
Pericardiocentesis 0W9D30Z 0W9D3ZX 0W9D3ZZ 0W9D40Z 0W9D4ZX 0W9D4ZZ 0W9D0ZX 0W9D0ZZ
Cardiac tamponade I31.4
Cerebral infarction G43.601 G43.609 G43.611 G43.619 I63.00 I63.011 I63.012 I63.013 I63.019 I63.02 I63.031 I63.032 I63.033 I63.039 I63.09 I63.10 I63.111 I63.112 I63.113 I63.119 I63.12 I63.131 I63.132 I63.133 I63.139 I63.19 I63.20 I63.211 I63.212 I63.213 I63.219 I63.22 I63.231 I63.232 I63.233 I63.239 I63.29 I63.30 I63.311 I63.312 I63.313 I63.319 I63.321 I63.322 I63.323 I63.329 I63.331 I63.332 I63.333 I63.339 I63.341 I63.342 I63.343 I63.349 I63.39 I63.40 I63.411 I63.412 I63.413 I63.419 I63.421 I63.422 I63.423 I63.429 I63.431 I63.432 I63.433 I63.439 I63.441 I63.442 I63.443 I63.449 I63.49 I63.50 I63.511 I63.512 I63.513 I63.519 I63.521 I63.522 I63.523 I63.529 I63.531 I63.532 I63.533 I63.539 I63.541 I63.542 I63.543 I63.549 I63.59 I63.6 I63.8 I63.81 I63.89 I63.9
Hemorrhagic stroke I60.00 I60.01 I60.02 I60.10 I60.11 I60.12 I60.2 I60.20 I60.21 I60.22 I60.30 I60.31 I60.32 I60.4 I60.50 I60.51 I60.52 I60.6 I60.7 I60.8 I60.9 I61.0 I61.1 I61.2 I61.3 I61.4 I61.5 I61.6 I61.8 I61.9 I62.00 I62.01 I62.02 I62.03 I62.1 I62.9
Gastrointestinal bleeding K92.0 K92.1 K92.2

CABG: Coronary artery bypass grafting; CAD: coronary artery disease; MI: myocardial infarction; PCI: Percutaneous coronary intervention; STEMI: ST segment elevation myocardial infarction

Figure S1. Prevalence of ET and PV AMI



AMI, acute myocardial infarction; ET, essential thrombocythemia; PV, polycythemia vera.

Figure S2. Subgroup analyses of in-hospital mortality for AMI with ET

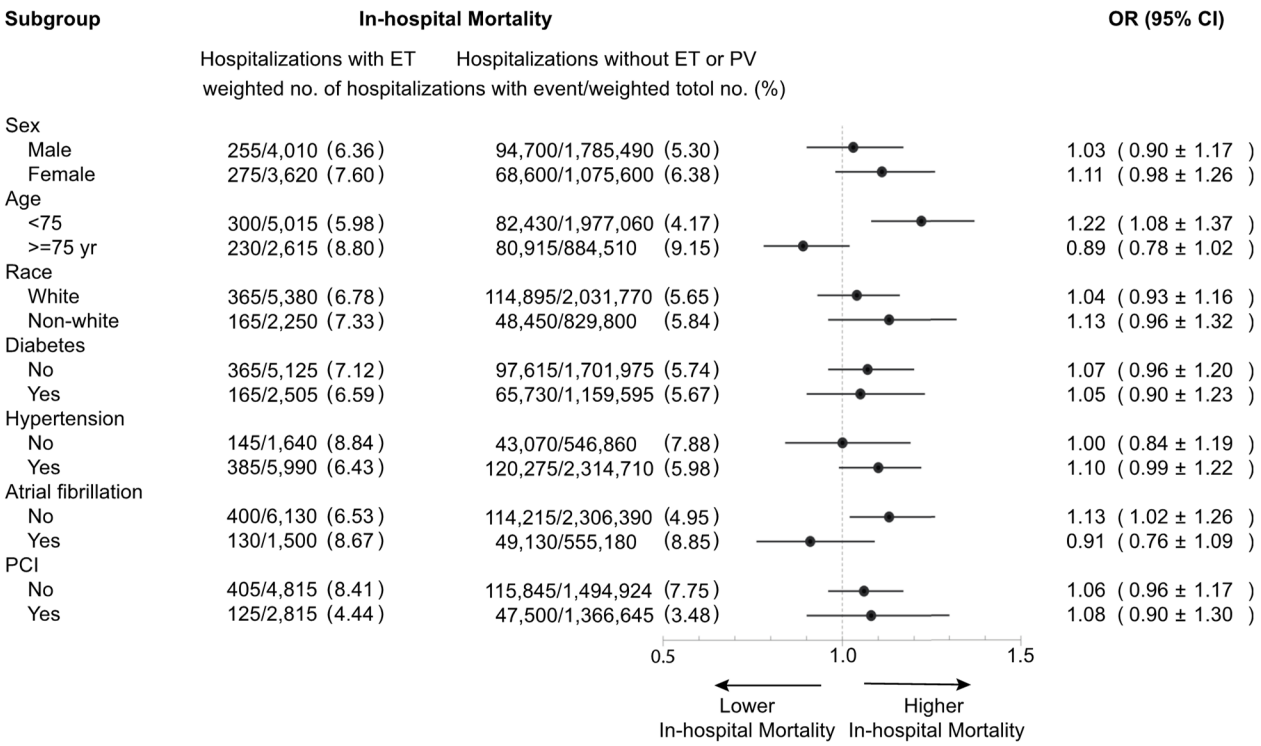


Figure S3. Subgroup analyses of in-hospital mortality for AMI with PV

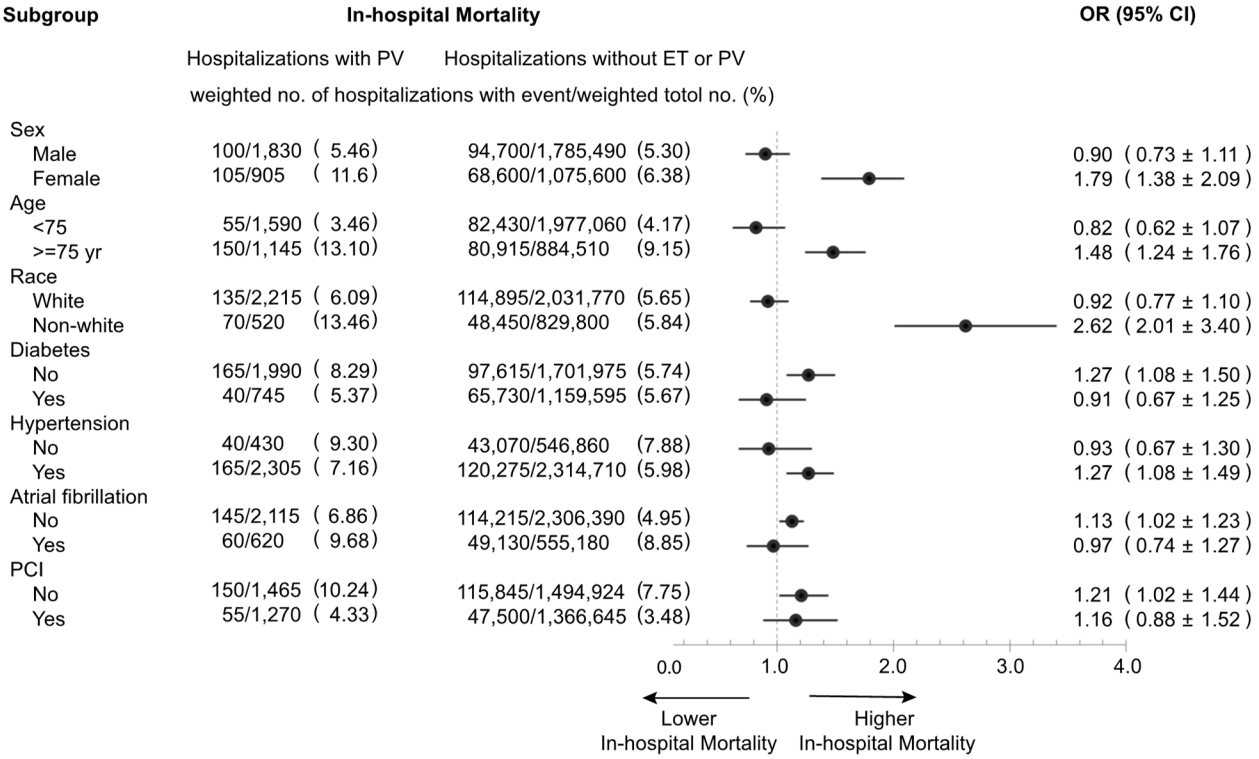


Figure S4. Subgroup analyses of MACCE for AMI with ET

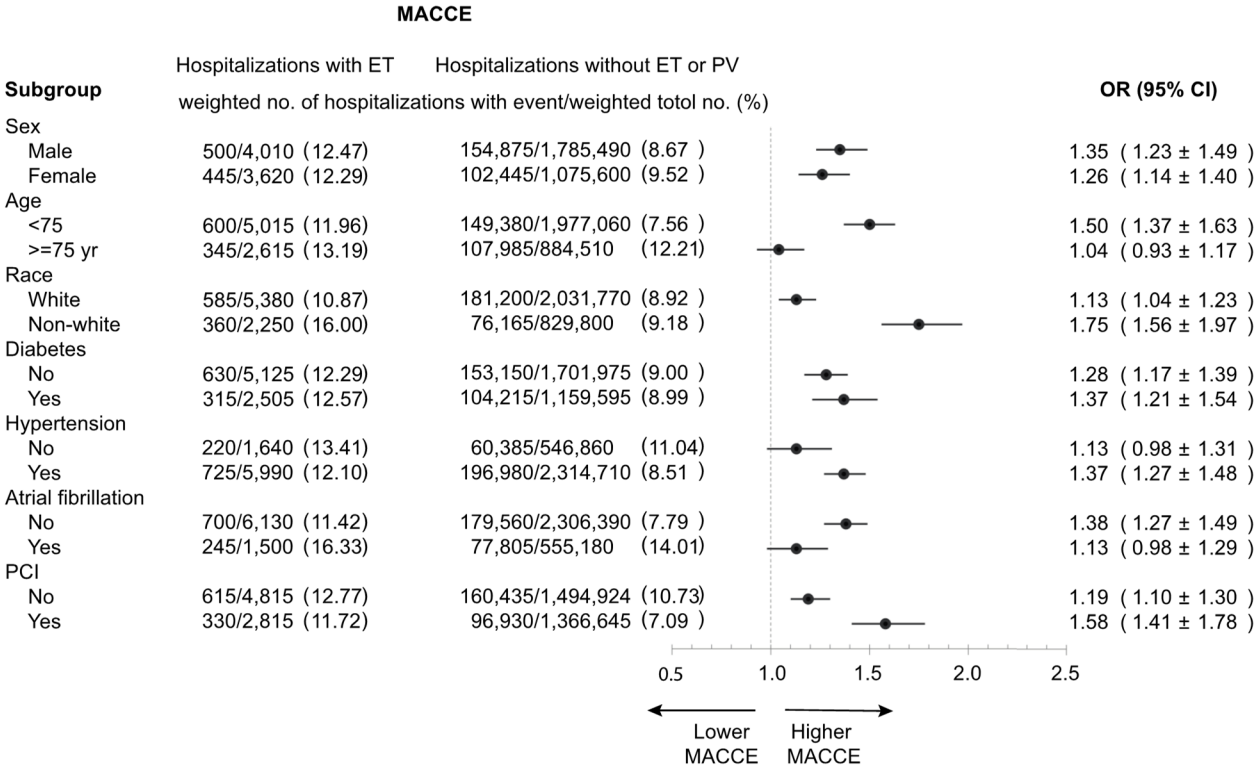


Figure S5. Subgroup analyses of MACCE for AMI with PV

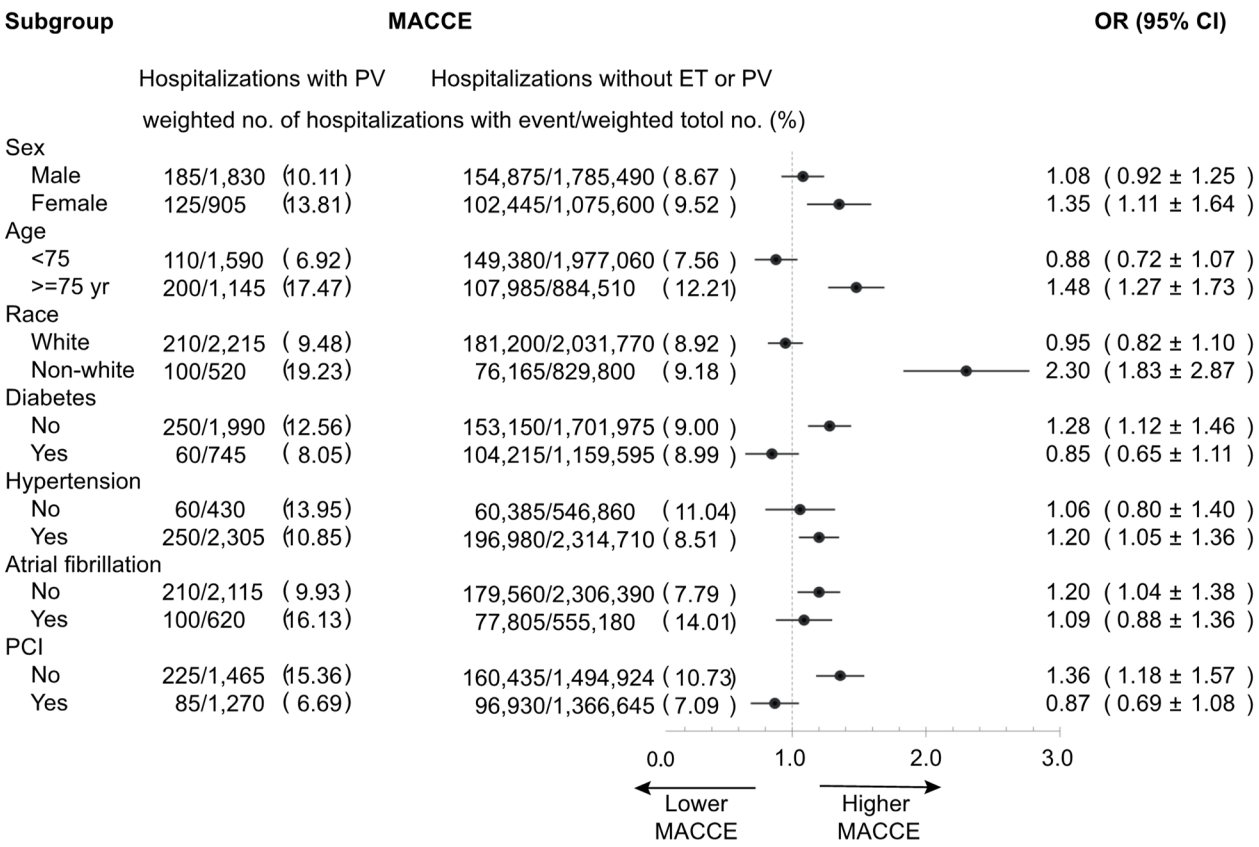


Figure S6. Subgroup analyses of bleeding for AMI with PV

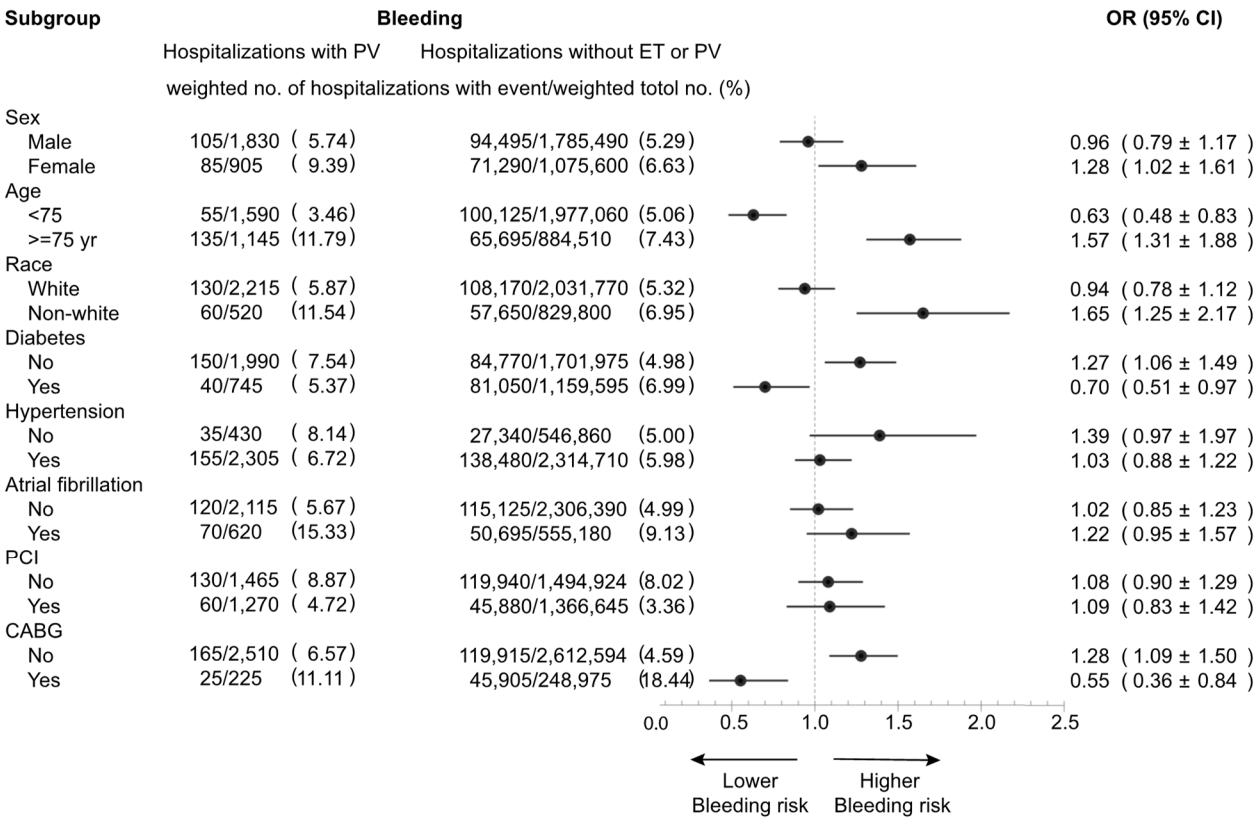


Figure S7. Subgroup analyses of stroke for AMI with ET

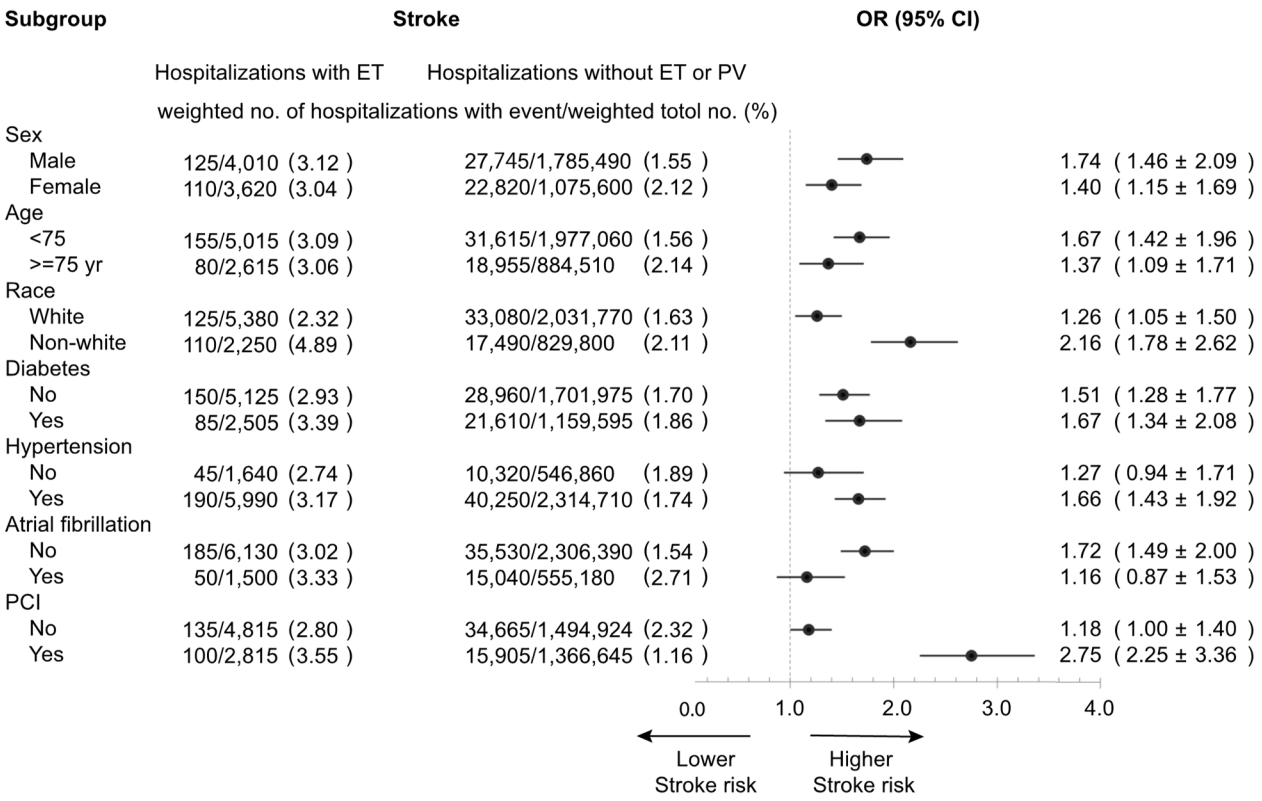


Figure S8. Subgroup analyses of stroke for AMI with PV

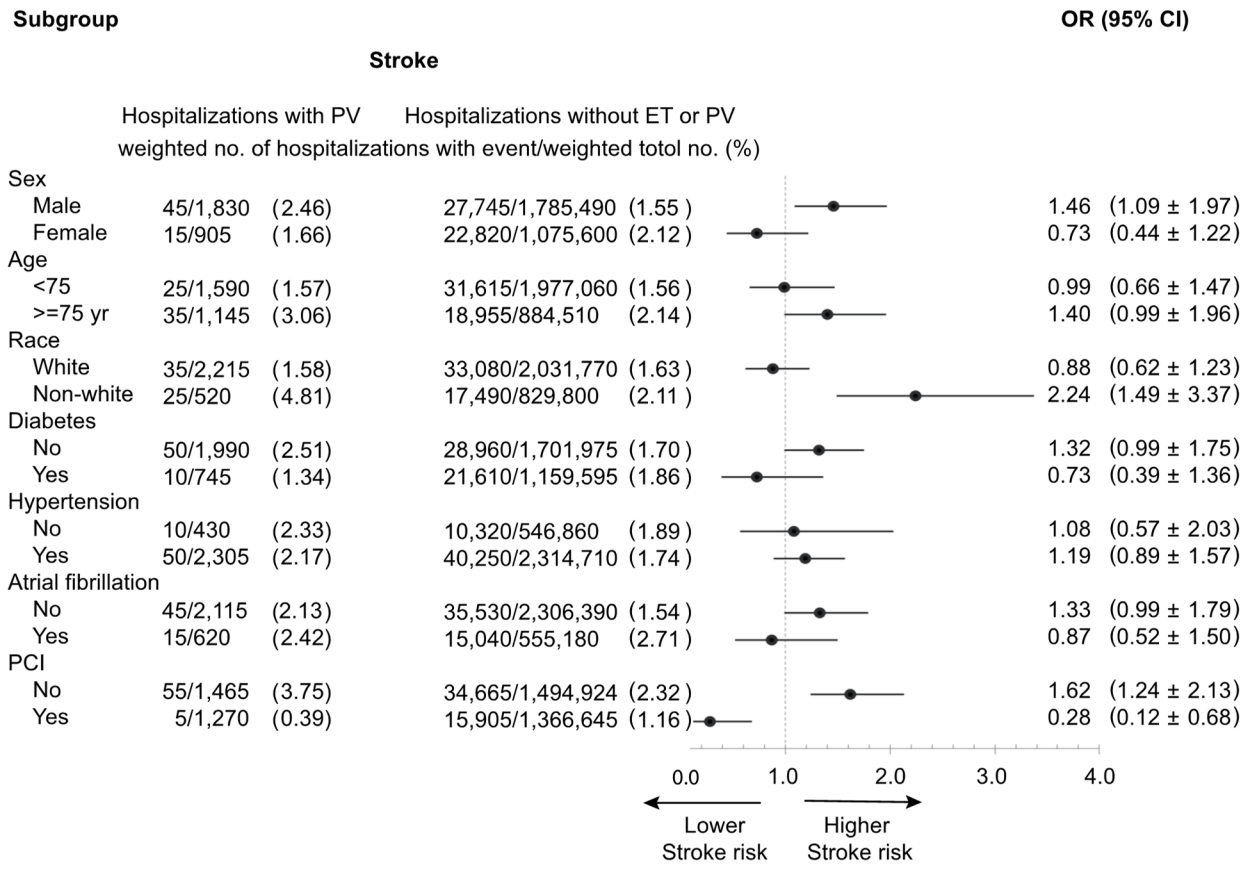


Figure S9. standardized mean differences for AMI with ET before and after propensity score match

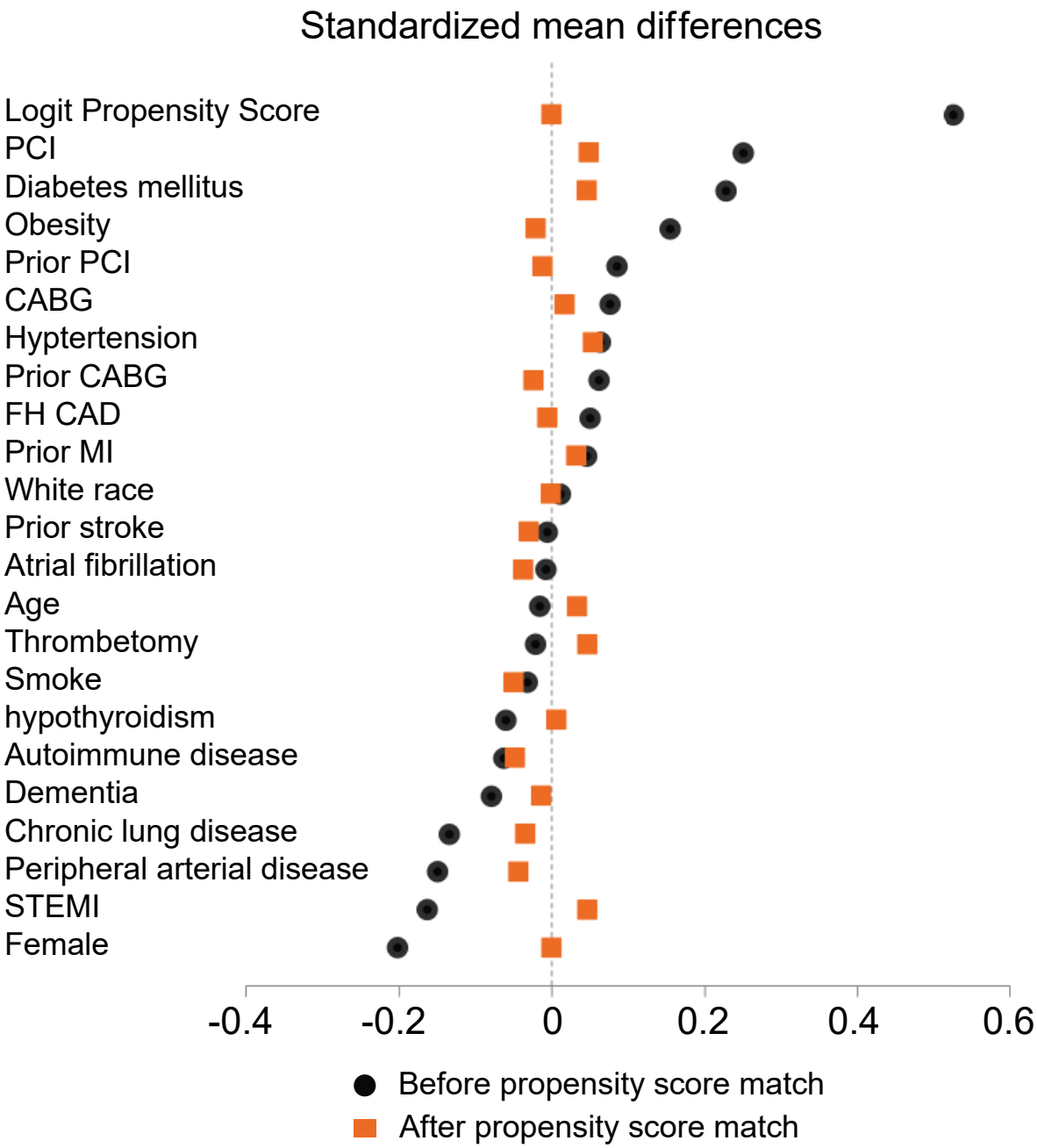


Figure S10. standardized mean differences for AMI with PV before and after propensity score match