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Original Article

Antithrombotic Management and Outcomes of Anterior ST-Elevation Myocardial Infarction With New-Onset Wall Motion Abnormalities in Men and Women

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ABSTRACT

Background: In patients with anterior ST-elevation myocardial infarction (STEMI) and new-onset antero-apical wall motion abnormalities (WMAs), whether the rate of prophylaxis against left ventricular thrombus and outcomes differ between men and women is unknown.

Methods: A multicentre retrospective cohort study of patients with STEMI and new-onset antero-apical WMAs treated with primary percutaneous coronary intervention was conducted. Patients with an established indication of oral anticoagulation (OAC) were excluded.

RÉSUMÉ

Contexte : On ignore si le taux de prophylaxie contre le thrombus ventriculaire gauche et les résultats thérapeutiques diffèrent entre les hommes et les femmes qui ont subi un infarctus du myocarde avec élévation du segment ST (STEMI) antérieur et ont des anomalies du mouvement pariétal (AMP) antéroapical d'apparition récente.

Méthodes : Nous avons mené une étude de cohorte rétrospective multicentrique auprès de patients qui ont subi un STEMI et ont des AMP d'apparition récente traitées par une intervention coronarienne percutanée primaire. Nous avons exclu les patients chez lesquels il

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The rates of triple therapy (double antiplatelet therapy + OAC) at discharge were compared for women vs men. The rates of net adverse clinical events, a composite of mortality, myocardial infarction, stroke or transient ischemic attack, systemic thromboembolism or Bleeding Academic Research Consortium (BARC) type 3 or 5 bleeding at 6 months were compared across sex using a multivariate logistic regression model.

Results: A total of 1664 patients were included in the primary analysis, of whom 402 (24.2%) were women and 1262 (75.8%) were men. A total of 138 women (34.3%) and 489 men (38.7%) received a triple therapy prescription at discharge ($P = 0.11$). At 6 months, 33 women (8.2%) and 96 men (7.6%) experienced a net adverse clinical event (adjusted odds ratio 0.82; 95% confidence interval 0.49-1.37). No difference occurred in the risk of bleeding events and ischemic events between men and women, when these were analyzed separately.

Conclusions: The rates of OAC prescription for left ventricular thrombus prophylaxis and clinical outcomes at 6 months were similar in women and men following anterior STEMI with new-onset antero-apical WMAs.

existait une indication établie à l'anticoagulation orale (ACO). Nous avons comparé les taux de trithérapie (bithérapie antiplaquettaire + ACO) à la sortie de l'hôpital entre les femmes et les hommes. Nous avons comparé les taux d'événements indésirables cliniques nets, le critère composite de mortalité, d'infarctus du myocarde, d'accident vasculaire cérébral ou d'accident ischémique transitoire, la thromboembolie systémique ou l'hémorragie de type 3 ou 5 selon le Bleeding Academic Research Consortium (BARC) après 6 mois entre les sexes au moyen du modèle de régression logistique multivariée.

Résultats : Au sein des 1 664 patients de l'analyse principale, 402 (24,2 %) étaient des femmes et 1262 (75,8 %) étaient des hommes. Un total de 138 femmes (34,3 %) et de 489 hommes (38,7 %) ont reçu une ordonnance de trithérapie à la sortie de l'hôpital ($P = 0,11$). Après 6 mois, 33 femmes (8,2 %) et 96 hommes (7,6 %) ont subi un événement indésirable net (rapport de cotes ajusté 0,82 ; intervalle de confiance à 95 % 0,49-1,37). Aucune différence n'a été notée dans le risque d'événements hémorragiques et d'événements ischémiques entre les hommes et les femmes lorsque ces événements étaient analysés séparément.

Conclusions : Les taux d'ordonnances d'ACO en prophylaxie du thrombus ventriculaire gauche et les résultats cliniques après 6 mois étaient similaires entre les femmes et les hommes à la suite du STEMI antérieur et des AMP antéroapicale d'apparition récente.

Lay Summary

In patients in whom the heart muscle contracts abnormally after a heart attack, whether men and women differ in relation to the rate of either prescription of blood thinners or future complications is unknown. Medical records of these patients, from 8 Quebec hospitals, were used to assess prescriptions of blood thinners at discharge and complications at follow-up, including death, heart attack, stroke, and bleeding. The rates of prescriptions and complications did not differ between men and women.

Left ventricular thrombus (LVT) remains a prevalent complication of anterior acute myocardial infarction (AMI) in the contemporary era, predisposing patients to potentially fatal cardioembolic complications, such as embolic stroke.[1] The risk of LVT development following AMI appears to be greater in those with reduced ejection fraction and/or anterior apical akinesis or dyskinesis,[2-6] but prophylactic anticoagulation for the prevention of LVT formation in this setting remains controversial (class IIb recommendation).[7,8]

When experiencing symptoms of AMI, women take longer than men to seek medical attention, and they experience longer treatment delays.[9-11] These delays in presentation and care increase the level of morbidity and mortality in women and may increase the risk of LVT after anterior AMI. Women are also at higher risk than men of bleeding complications following percutaneous coronary intervention (PCI) [12-14] and are less often discharged on optimal medical therapy following ST-elevation myocardial infarction (STEMI).[15-17]

However, whether men and women differ in the use of LVT prophylaxis, and whether women are at higher risk than men of either bleeding or thromboembolic complications in the setting of anterior STEMI with new-onset antero-apical wall motion abnormalities (WMAs), is unknown. We therefore sought to describe differences between women and men in the rates of initiation of oral anticoagulation (OAC) for LVT prophylaxis and of bleeding and thromboembolic complications in this population.

Methods

The **Ma**na**g**ement of STEMI with Anterior Wall Motion Abnormalities Using Triple Versus Double Anti-Thrombot**ic** Therapy (MAGIC) study was a retrospective, multicentre, observational cohort study conducted in 8 academic hospital centres with onsite cardiac catheterization laboratories in the province of Quebec, Canada. The study was designed to assess the comparative effectiveness and safety of dual-antiplatelet therapy (DAPT) alone vs triple therapy (TT; DAPT in addition to OAC) in patients with anterior STEMI and new-onset anterior or apical WMAs treated with primary PCI. Central ethics approval of the project was obtained from the Montreal Heart Institute Research Ethics Committee. Results are reported according to the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines.[18]

Patients and data collection

Patients hospitalized between 2009 and 2017 with a diagnosis of STEMI, as determined by the inclusion of the International Classification of Diseases, version 9 code 410 or version 10 code I.21 on discharge summaries, were reviewed manually to assess eligibility in each participating centre. Patients aged $\geq$ 18 years with anterior STEMI, who were treated with primary PCI, and had at least one anterior or apical segment presenting hypokinesis, akinesis, dyskinesis, or aneurysm on the first transthoracic echocardiography performed during the index hospitalization were included. Patients with known preexisting antero-apical WMAs, LVT on

the first transthoracic echocardiography performed during index hospitalization, or a concomitant indication for OAC (eg, atrial fibrillation) were excluded from the study. Baseline and follow-up data for up to 6 months after the index event were extracted from hospital medical records, deidentified, and recorded in a secure electronic database. Patients' demographic characteristics and comorbidities were used to determine a stroke risk score as previously defined in the literature.[19] Patients for whom no data at follow-up were available were excluded. For the present analysis, all comparisons were stratified by sex (women vs men).

Endpoints

The primary endpoint is the net adverse clinical events (NACE) composite outcome consisting of all-cause mortality, nonfatal AMI, stroke or transient ischemic attack (TIA), systemic thromboembolism, or Bleeding Academic Research Consortium (BARC) type 3 or 5 bleeding at 6 months.[20] Secondary exploratory endpoints included the individual components of the primary endpoint, an ischemic events composite endpoint (all-cause mortality, nonfatal myocardial infarction, ischemic stroke or TIA, or systemic thromboembolism), and an irreversible events composite endpoint (all-cause mortality, nonfatal myocardial infarction, stroke, or systemic thromboembolism with limb loss or intracranial bleeding), intracranial bleeding, and any bleeding at 6 months. AMI, stroke, TIA, and systemic thromboembolism are defined according to the American College of Cardiology/American Heart Association Key Data Elements and Definitions for Cardiovascular Endpoint Events in Clinical Trials.[21] Bleeding types were defined according to the Bleeding Academic Research Consortium categories.[20]

Statistical analysis

The statistical analysis plan was prespecified, before the analyses were conducted, but after the data were collected. Continuous data are expressed as mean with standard deviation, and categorical variables are expressed as counts with percent proportions. Comparison of baseline, clinical, paraclinical, and procedural characteristics, as well as medication at discharge, 3-month follow-up, and 6-month follow-up, between the groups of women vs men, were made using a χ^2 test for categorical variables and a Student t test for continuous variables. For patients receiving TT, the intended and actual duration of OAC treatment for men vs women were compared using a χ^2 test.

Counts with percent proportions are used as summary statistics for the primary and secondary explanatory endpoints. A 2-group comparison of NACE at 6 months was made using an unadjusted odds ratio (OR). Then, adjustment for confounders was performed using a multivariate logistic regression model. Based on subject-matter knowledge, covariates judged a priori as potential confounders and with significant differences between women and men were included in the forward-selection stepwise model (entry $P = 0.20$; exit $P = 0.05$), with the objective of maintaining a proportion of 1 covariate in the model for 10 NACE. Covariates retained in the adjustment model were as follows: age, hypertension, dyslipidemia, smoking, previous stroke or TIA, multiple-vessel PCI, hemoglobin, creatinine, left ventricular ejection fraction, degree of worse WMAs, angiotensin-converting enzyme inhibitor, and anticoagulation regimen prescribed at discharge (DAPT vs TT). Unadjusted and adjusted ORs from the multivariate logistic regression model with 95% confidence intervals (CIs) are reported. Similar analyses were conducted for the secondary endpoints. Additionally, to examine the potential interaction between sex and antithrombotic management strategy received at discharge (DAPT vs TT), a multivariate logistic regression model that includes an interaction term and other variables included in the model for NACE was performed.

All statistical analyses were conducted using SPPS 27 statistical software (IBM, Armonk, NY). A 2-tailed $P < 0.05$ was considered statistically significant without correction for multiple analyses, in this exploratory study.

Results

From 2009 to 2017, a total of 2067 patients met the inclusion criteria, but 403 patients (19.5%) were lost to follow-up and therefore were excluded from the primary analysis (n = 104 women [20.6%] and n = 299 men [22.0%]; Fig. 1). A total of 1664 patients met the eligibility criteria and were included in the primary analysis, of whom 402 were women (24.2%) and 1262 were men (75.8%).

Compared to men, women were older, more likely to have hypertension, and more likely to have a higher stroke risk score ($P < 0.01$ for all; Table 1). Men were more likely to have a history of active smoking and to have a history of prior PCI ($P < 0.01$ for both). Women were less likely to have undergone a multivessel PCI ($P = 0.04$), had a lower estimated glomerular filtration rate ($P < 0.01$), and had lower hemoglobin levels ($P < 0.01$; Table 2).

Medications at discharge, 3 months, and 6 months are described in Table 3. Women were less likely to be discharged on angiotensin-converting enzyme inhibitors ($P = 0.03$), but they were more likely to be discharged on a proton-pump inhibitor ($P < 0.01$). Women were more likely to receive clopidogrel than other more potent P2Y12 receptor inhibitors at discharge and during the follow-up period ($P < 0.01$). TT was prescribed at discharge in 138 women (34.3%) and 489 men (38.7%; $P = 0.11$). Patients treated with TT were prescribed clopidogrel (n = 774; 92.7%) more frequently than potent P2Y12 inhibitors (ticagrelor n = 24 [2.9%]; prasugrel n = 35 [4.2%]; ticlopidine n = 2 [0.2%]). Both the intended and actual duration of OAC therapy also were similar in men and women (Supplemental Table S1).

A total of 96 men (7.6%) and 33 women (8.2%) experienced a NACE at 6 months (unadjusted OR: 1.09; 95% CI: 0.72-1.64; Table 4). After multivariate logistic regression analysis, no significant difference was present between women and men in the odds of NACE at 6 months (OR: 0.73; 95% CI: 0.41-1.30). No significant difference between sexes was present in the risk of ischemic events, irreversible events, and any bleeding event at 6 months. Models including an interaction term between sex and antithrombotic management strategy received at discharge led to similar results, and no significant interaction was observed for any outcome.

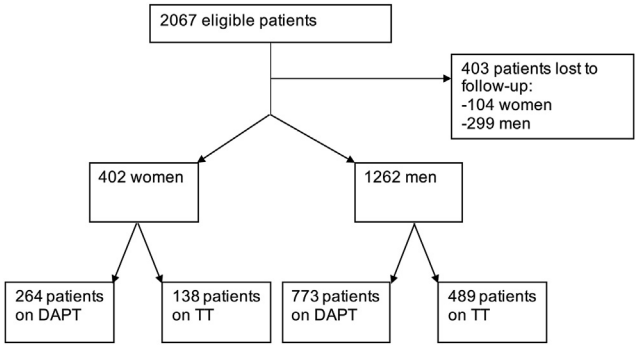

Figure 1. Flowchart of study participants. DAPT, dual-antiplatelet therapy; TT, triple therapy (DAPT + oral anticoagulation).

Discussion

To our knowledge, this study is the first to assess sex differences in prophylaxis strategies and clinical outcomes among patients at risk of LVT formation in the setting of anterior STEMI with new-onset antero-apical WMAs. We demonstrated that antithrombotic management strategies as well as the actual duration of OAC therapy for LVT prophylaxis were similar between women and men, despite the fact that women were less likely to be prescribed optimal medical therapy at discharge following STEMI, including angiotensin-converting enzyme inhibitors and more-potent P2Y12 inhibitors (ticagrelor and prasugrel). The number of NACE at 6 months was relatively low, but we found no difference between women and men in the rate of NACE, ischemic events, and bleeding events at 6 months (Box 1).

The currently evidence in the literature is scant regarding sex differences in TT, whether for LVT prophylaxis in STEMI patients with antero-apical WMAs or in other clinical settings in which TT might be indicated (eg, patients with atrial fibrillation undergoing PCI). With regard to antiplatelet therapy, however, previous studies have shown that the choice of P2Y12 inhibitor might be influenced by sex. The **S**urvey on An**t**icoagulated P**a**t**i**ents **R**egis**t**er (START)-ANTIPLATELET registry (a prospective, real-world registry that includes consecutive patients admitted for acute coronary syndrome in 7 Italian high-volume cardiology centres) included consecutive acute coronary syndrome patients undergoing revascularization or referred to medical therapy, including DAPT, and found similar results.[22] Clopidogrel was more often prescribed for women, whereas the more-potent P2Y12 inhibitor prasugrel was initiated more often for men, but the rates of major adverse cardiac and cerebrovascular events (MACE) and NACE (based on major adverse cardiac and cerebrovascular events plus major bleeding) were similar between women and men in the START-ANTIPLATELET registry.[22] Post hoc analyses of the PROMETHEUS and **Tr**eatment With **A**denosine Diphosphate Receptor I**n**hibitor**s**: **L**ongitudinal **A**ssessment of **T**reatment Patterns and Events After **A**cute **C**oronary **S**yndrome (TRANSLATE-ACS) studies also have shown that prasugrel was less frequently prescribed for women, but that the risk of MACE was similar between women and men.[23,24] This finding suggests that although the choice of P2Y12 inhibitor might be influenced by sex, a DAPT choice tailored by balancing ischemic and bleeding risk is associated with similar clinical outcomes irrespective of sex. Similarly, in the present observational cohort, the decision to prescribe LVT prophylaxis could have been influenced by a higher perceived baseline risk of stroke in women (as confirmed by the higher average stroke risk score). Thus, the similarity in OAC prescription and outcomes might not have been observed had the sex cohorts had similar stroke risk profiles at baseline.

Indeed, our finding that women were less likely to be prescribed optimal medical therapy after STEMI, including angiotensin-converting enzyme inhibitors and the more-potent P2Y12 inhibitors, is in keeping with numerous previous studies that have shown lower rates of prescription of statins, beta-blockers, angiotensin receptor inhibitors blockers, and angiotensin-converting enzyme inhibitors.[15-17,25,26] Similar higher stroke risk scores and initiation of TT at discharge in both women and men in this cohort could represent a specific context in which clinical decision-making and application of current guidelines recommendations are similar between the sexes. However, the present analyses may be underpowered to detect such a difference, given the smaller number of women, and for some outcomes, the very small number of events.

Whether men and women differ in the rate of bleeding and thromboembolic events in the specific setting of STEMI with new-onset antero-apical WMAs is currently unknown. However, many studies have reported on sex differences in the

Table 1. Baseline characteristics in women and men

Characteristic*	Women (n = 402)	Men (n = 1262)	*P*
Year of procedure			0.49
2009	0 (0.0)	1 (0.1)	
2010	55 (13.7)	204 (16.2)	
2011	78 (19.4)	229 (18.1)	
2012	71 (17.7)	239 (18.9)	
2013	65 (16.2)	230 (18.2)	
2014	73 (18.2)	214 (17.0)	
2015	60 (14.9)	114 (11.4)	
2017	0 (0.0)	1 (1.0)	
Age, y, mean ± SD	66.80 ± 13.11	60.24 ± 11.33	< 0.01*
Obesity	84 (21.4)	317 (25.5)	0.10
Diabetes mellitus	77 (19.2)	235 (18.6)	0.82
Hyperlipidemia	226 (56.2)	704 (55.9)	0.90
Hypertension	212 (52.7)	539 (42.7)	< 0.01*
Current smoking	128 (32.0)	499 (39.8)	< 0.01*
Prior myocardial infarction	34 (8.5)	140 (11.1)	0.13
Previous PCI	29 (7.2)	150 (11.9)	< 0.01*
Previous CABG	5 (1.2)	9 (0.7)	0.31
Previous stroke or TIA	14 (3.5)	34 (2.7)	0.41
Chronic liver disease	5 (1.2)	6 (0.5)	0.10
Chronic kidney disease	18 (4.5)	35 (2.8)	0.10
Stroke Risk Score[19]			< 0.01*
1	99 (25.7)	383 (31.8)	
2	113 (29.4)	297 (24.6)	
3	73 (19.0)	123 (10.2)	
4	19 (4.9)	22 (1.8)	
5	7 (1.8)	16 (1.3)	
6	4 (1.0)	9 (0.7)	
7	7 (1.8)	1 (0.1)	

Values are n (%), unless otherwise indicated.

CABG, coronary artery bypass graft; PCI, percutaneous coronary intervention; SD, standard deviation; TIA, transient ischemic attack.

* Percentage among those with available data. Less than 5% of data was missing for all variables.

Table 2. Clinical, paraclinical, and procedural characteristics of patients during index hospitalization for myocardial infarction according to sex

Characteristic*	Women (n = 402)	Men (n = 1262)	*P*
Clinical presentation			
Systolic blood pressure, mm Hg	132.25 ± 27.44	130.08 ± 26.46	0.16
Heart rate, bpm	84.55 ± 17.95	81.54 ± 18.23	< 0.01*
Killip class 3 or 4	176 (14.3)	57 (14.6)	0.16
Angiographic characteristics			
Radial access	262 (67.2)	954 (75.8)	< 0.01*
Culprit artery			0.33
LM	2 (0.5)	13 (1.0)	
LAD	382 (96.7)	1229 (97.6)	
LCx	5 (1.3)	10 (0.8)	
Other	6 (1.5)	7 (0.6)	
DES	216 (56.4)	689 (55.7)	0.88
Number of stents in culprit artery			0.17
0	22 (5.6)	38 (3.0)	
1	268 (67.7)	839 (66.7)	
2	84 (21.2)	297 (23.6)	
3	18 (4.5)	61 (4.9)	
4	4 (1.0)	18 (1.4)	
5	0 (0.0)	4 (0.3)	
Multivessel CAD	210 (52.9)	688 (54.5)	0.56
Multivessel PCI	51 (12.8)	217 (17.2)	0.04*
Biochemical characteristics			
Creatinine, umol/L	76.02 ± 27.28	89.29 ± 38.96	< 0.01*
eGFR,† mL/min per 1.73 m^2	74.61 ± 25.37	83.13 ± 23.82	< 0.01*
Hemoglobin, g/L	131.64 ± 16.44	144.56 ± 38.96	< 0.01*
Echographical characteristics			
LV ejection fraction, %	40.12 ± 10.08	40.59 ± 10.39	0.44
Wall motion score index	1.80 ± 0.36	1.81 ± 0.37	0.88
Degree of the worst anterior wall motion abnormality			0.54
Hypokinesis	53 (15.3)	167 (15.2)	
Akinesis	276 (79.8)	890 (81.1)	
Dyskinesis	17 (4.9)	38 (69.1)	
LV aneurysm	13 (3.3)	39 (3.2)	0.90

Values are n (%) or mean ± standard deviation, unless otherwise indicated.

bpm, beats per minute; CAD, coronary artery disease; DES, drug-eluding stent; eGFR, estimated glomerular filtration rate; LAD, left anterior descending; LCx, left circumflex; LM, left main; LV, left ventricular; PCI, percutaneous coronary intervention.

*Percentage among those with available data. Less than 5% of data was missing for all variables, except for wall motion score index (30.0%) and degree of worse wall motion abnormality (13.3%).

†eGFR is calculated using the modification of diet in renal disease (MDRD) formula.

Table 3. Medication at discharge, 3 months, and 6 months, according to sex

Medication At discharge*	Women (n = 402)	Men (n = 1262	*P*
Triple therapy	138 (34.3)	489 (38.7)	0.11
Aspirin	402 (100.0)	1261 (100.0)	0.30
P2Y12 receptor inhibitors			0.03*
Clopidogrel	285 (71.3)	833 (66.1)	
Ticagrelor	84 (21.1)	260 (20.6)	
Prasugrel	31 (7.8)	164 (13.0)	
OAC			0.26
Warfarin	138 (34.6)	483 (38.5)	
Rivarobaxan	0 (0.0)	2 (0.2)	
Apixaban	0 (0.0)	0 (0.0)	
Dabigatran	0 (0.0)	4 (0.4)	
Proton-pump inhibitor	288 (71.6)	798 (63.5)	< 0.01*
Beta-blockers	370 (92.5)	1186 (94.4)	0.16
ACE inhibitors	327 (81.5)	1081 (85.9)	0.03*
Angiotensin-II receptor blockers	30 (7.5)	77 (6.1)	0.33
Mineralocorticoid receptor antagonists	48 (11.9)	162 (12.9)	0.62
Statins	385 (95.8)	1229 (97.8)	0.07
At the 3-month follow-up*			
Aspirin	349 (97.5)	1115 (98.9)	0.04*
P2Y12 receptor inhibitors			< 0.01*
Clopidogrel	232 (65.4)	723 (64.7)	
Ticagrelor	74 (20.8)	220 (19.7)	
Prasugrel	25 (7.0)	133 (11.9)	
OAC			0.08
Warfarin	64 (19.8)	199 (19.7)	
Rivarobaxan	2 (0.6)	0 (0.0)	
Apixaban	0 (0.0)	4 (0.4)	
Dabigatran	1 (0.3)	2 (0.2)	
At the 6-month follow-up*			
Aspirin	333 (97.7)	1067 (98.4)	0.54
P2Y12 receptor inhibitors			< 0.01*
Clopidogrel	218 (64.7)	682 (63.7)	
Ticagrelor	61 (18.1)	205 (19.1)	
Prasugrel	21 (6.2)	125 (11.7)	
OAC			0.49
Warfarin	19 (6.1)	48 (4.9)	
Rivarobaxan	3 (1.0)	2 (0.2)	
Apixaban	1 (0.3)	4 (0.4)	
Dabigatran	0 (0.0)	1 (0.1)	

Values are n (%), unless otherwise indicated.

ACE, angiotensin-converting enzyme; OAC, oral anticoagulation; TT: triple therapy (dual antiplatelet therapy + OAC).

*Percentage among those with available data. Less than 5% of data was missing for all variables at discharge. The level of missing data at 3 months varied between 10.8% and 19.9%; the level of missing data at 6 months varied between 14.2% and 22.8%.

STEMI population undergoing PCI. Women seem to have a higher risk of bleeding after a STEMI-indicated PCI, even after adjusting for differences in demographic, clinical, and treatment profiles, [24,27-29] but they have a similar risk of MACE.[24,27,28,30] Although the results for MACE were similar in our study, we found no difference in bleeding rates between women and men. This finding might be explained by the fact that the preferred P2Y12 inhibitor in women, in whom the bleeding risk may have been higher, was more frequently clopidogrel, a less-potent P2Y12 inhibitor. An interesting finding of our study is that radial access was used less frequently in women. Similar results were also observed in the Victorian Cardiac Outcomes Registry, with radial access used less frequently in women, independent of comorbidities and objective markers of body size.[29]

Larger studies are required to assess whether differences are present between women and men in the safety and effectiveness of OAC in addition to DAPT, so-called TT, regardless of setting (eg, atrial fibrillation patients after PCI, and LVT after STEMI treated with PCI) or LVT prophylaxis after anterior STEMI with new-onset antero-

Table 4. Individual and composite odds ratio of net adverse clinical events (NACE) of patients at 6 months

Outcomes	Events in women	Events in men	Unadjusted OR (95% CI)	Adjusted OR (95% CI)*	Adjusted OR with interaction (95% CI)†	*P* for interaction†
NACE	33 (8.2)	96 (7.6)	1.09 (0.72−1.64)	0.73 (0.41−1.30)	1.52 (0.36−6.47)	0.38
All-cause mortality	11 (2.7)	41 (3.2)	0.84 (0.43−1.65)	0.46 (0.20−1.09)	0.23 (0.02−2.69)	0.54
Myocardial infarction	13 (3.2)	44 (3.5)	0.93 (0.49−1.74)	0.78 (0.36−1.71)	1.81 (0.19−17.23)	0.45
Systemic thromboembolism	2 (0.5)	4 (0.3)	1.57 (0.29−8.62)	1.32 (0.11−15.47)	NA	1.00
Ischemic stroke or TIA	5 (1.2)	5 (0.4)	3.17 (0.91−10.99)	2.90 (0.56−15.16)	NA	1.00
Irreversible event	25 (6.2)	84 (6.7)	0.93 (0.59−1.48)	0.64 (0.36−1.13)	0.83 (0.16−4.23)	0.75
Ischemic event	31 (7.7)	87 (6.9)	1.13 (0.74−1.73)	0.86 (0.50−1.46)	1.23 (0.27−5.51)	0.62
All type BARC bleeding	24 (6.0)	74 (5.9)	1.02 (0.63−1.64)	1.01 (0.56−1.82)	3.32 (0.62−17.81)	0.15
BARC type 3 bleeding	3 (0.7)	13 (0.1)	0.67 (0.17−2.59)	0.52 (0.04−6.50)	NA	1.00
BARC type 5 bleeding	1 (0.0)	0 (0.0)	NA	NA	NA	NA
Intracranial bleeding	0 (0.0)	0 (0.0)	NA	NA	NA	NA

Values are n (%), unless otherwise indicated.

BARC, Bleeding Academic Research Consortium; CI, confidence interval; NA, not applicable; OR, odds ratio; TIA, transient ischemic attack.

*Adjusted for age, hypertension, dyslipidemia, smoking, previous stroke or TIA, multiple-vessel percutaneous coronary intervention, hemoglobin, creatinine, left ventricular ejection fraction, degree of worse wall motion abnormality, angiotensin-converting-enzyme inhibitor, and anticoagulation regimen prescribed at discharge (dual-antiplatelet therapy vs triple therapy [dual-antiplatelet therapy + oral anticoagulation]).

† Interaction between sex and antithrombotic management strategy at discharge.

apical WMAs. When such studies are conducted, differences in pharmacokinetics and metabolism should be considered, as women with atrial fibrillation been demonstrated to have a higher residual risk of stroke despite warfarin therapy, reflecting a difference in warfarin metabolism.[31,32] Such differences in effectiveness have not been observed with direct oral anticoagulants. DOAC-based antithrombotic regimens also deserve consideration in future studies.[32]

Certain limitations must be taken into consideration when interpreting the results from our study. First, this study is retrospective and observational and therefore prone to selection bias, and unrecognized or unmeasurable confounders could have influenced the results despite a robust multivariable adjustment analysis. Second, data were abstracted from patients' medical records. Although this method allowed for greater granularity than might have been derived from administrative data, the potential for ascertainment bias remains. Third, as the overall rates of TT prescription, and especially clinical events, were low, the study might not have been powered sufficiently to identify significant differences between groups. Finally, some patients were lost to follow-up because many STEMI patients are returned immediately to their community centre following primary PCI at the academic centre. However, the rate of loss to follow-up did not differ between men and women, so we consider this factor to be an unlikely source of bias in this analysis.

Box 1. Highlights

- Whether sex differences are present in the use of left ventricular thrombus prophylaxis in the setting of anterior ST-elevation myocardial infarction is unknown.
- The rates of oral anticoagulation prescription for left ventricular prophylaxis were similar in women vs men in this population.
- Additionally, clinical outcomes at 6 months were similar in women and men in this population.

Conclusion

The rate of initiation and the duration of OAC therapy for LVT prophylaxis are similar for women vs men in anterior STEMI patients with new-onset antero-apical WMA, a group of patients who are less likely to be prescribed optimal medical therapy at discharge, such as angiotensin-converting enzyme inhibitors and newer more-potent P2Y12 inhibitors. Women have similar ischemic and bleeding events as men following initiation of OAC in this setting, suggesting that they receive similar benefit, but larger trials are required to confirm these findings.

Ethics Statement

Central ethics approval of the project was obtained from the Montreal Heart Institute Research Ethics Committee.

Patient Consent

The authors confirm that patient consent is not applicable to this article. This is a retrospective case report using de-identified data; therefore, the IRB did not require consent from the patient.

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Supplementary Material

To access the supplementary material accompanying this article, visit *CJC Open* at https://www.cjcopen.ca/ and at https://doi.org/10.1016/j.cjco.2023.11.008.