Impact of Gender and Door-to-Balloon Times on Long-Term Mortality in Patients Presenting With ST-Elevation Myocardial Infarction

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Guidelines mandate emergent revascularization in patients presenting with ST-elevation myocardial infarction (STEMI) irrespective of gender. We sought to compare the door-to-balloon times and the impact of timely reperfusion on clinical outcomes in women compared with men presenting with STEMI undergoing primary percutaneous coronary intervention (PPCI). We analyzed data from 6,179 consecutive patients presenting with STEMI undergoing PPCI from the Melbourne Interventional Group registry (2005 to 2017). The primary outcome was long-term mortality. Of the 6,179 patients included 1,258 (20.3%) were female. Female patients were older (69 ± 13 vs 62 ± 12 years; p < 0.001), had more co-morbidities and had longer median symptom-to-balloon times (204 [interquartile range {IQR} 154 to 294] vs 181 [IQR 139 to 258] minutes; p < 0.001) and longer median door-to-balloon times (81 [IQR 55 to 102] vs 75 [IQR 51 to 102)] minutes; p < 0.001), while receiving less drug-eluting stents (39% vs 43%; p = 0.01) and having less radial access for PPCI (15% vs 21%; p < 0.001). Furthermore, female patients received less guideline-directed medical therapy than men with less prescription of aspirin (93.4% vs 95.4%; p = 0.02), statins (96.5% vs 97.6%; p < 0.05), and beta blockers (84.3% vs 89.4%; p < 0.001). Unadjusted in-hospital and 30-day mortality rates were higher in women (8.8% vs 6.2%, 9.8% vs 6.9%; p < 0.001). However, on Cox-proportional hazards modeling, gender was not an independent predictor of long-term mortality (hazards ratio 0.99, 95% confidence interval 0.83 to 1.18; p = 0.92) at a mean follow-up of 4.8 ± 3.5 years. In conclusion, in this large multicenter registry of patients with STEMI, women had longer ischemic times, higher risk profiles, and differing interventional approaches compared with men. Addressing these gender inequalities with early identification of symptoms, adherence to guideline-directed medical therapy, as well as higher rates of radial access and use of drug-eluting stents has the potential to further improve outcomes in women with STEMI. **(Am J Cardiol 2019;124:833−841)**

Guidelines mandate emergent revascularization in patients presenting with ST-elevation myocardial infarction (STEMI) irrespective of gender.[1] Timely revascularization, with a door-to-balloon-time (DTBT) of less than 90 minutes is considered a measure of quality care and is a class I recommendation.[2,3] There is extensive literature describing gender differences in the clinical presentation and pathophysiology of STEMI that may influence management and outcomes.[4,5] These studies suggest that women presenting with STEMI are older, have a higher burden of co-morbidities and are less likely to receive timely reperfusion.[6] It is uncertain whether the reported gender disparity in outcomes is attributable to these differences or additional factors, with limited data assessing the impact of gender and DTBT on long-term mortality in a STEMI cohort.[4,7] Accordingly, we sought to assess the trends in DTBT and the impact of timely reperfusion on clinical outcomes in men and women presenting with STEMI in a large multicenter registry over a 13-year period.

Methods

The cohort studied included consecutive patients who underwent percutaneous coronary intervention (PCI) for STEMI from January 2005 until June 2017 prospectively

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enrolled in the Melbourne Interventional Group (MIG) registry. The MIG registry is a multicenter PCI registry and has been described previously in detail.[8] Briefly, demographic, clinical, procedural, and in-hospital outcome data are prospectively recorded on case-report forms using standardized definitions for all fields, with follow-up performed at 30 days.[9]

The registry is coordinated by the Center of Cardiovascular Research and Education in Therapeutics, an independent research body within the School of Public Health and Preventive Medicine at Monash University (Melbourne, Australia). An audit of a number of verifiable fields from 5% of randomly selected procedures at each institution is performed periodically.[10] In the most recent audit, 27 fields were assessed with an accuracy of 98%. This compares favorably to the audit results from other large registries.[11] The ethics committee in each participating hospital has approved the MIG registry, including the use of "opt-out" consent. To "opt out" means that the participant is permitted to have any of the information about them removed from the MIG registry at any time.

STEMI was defined as electrocardiographic evidence of either ST-segment elevation or new or presumed new left bundle branch block that had not resolved within 20 minutes. The ST-elevation is defined as new or presumed new, continued ST-segment elevation at the J-point in 2 contiguous electrocardiographic leads (≥0.2 mV in men or ≥0.15 mV in women in leads V2 to V3 and/or ≥0.1 mV in other leads). In addition, cardiac biomarkers had to exceed the upper limits of normal at the relevant institution and a clinical presentation that is consistent with or suggestive of cardiac ischemia is required. Patients who presented within 12 hours of symptom onset and were diagnosed with STEMI were included. They were stratified by gender and their DTBT (≤60, 61 to 90, 91 to 120, >120 minutes). Patients with a delayed presentation (≥12 hours since onset of symptoms), current inpatients, patients transferred from another facility and those who received thrombolysis were excluded.

The primary end point for this study was long-term mortality. Survival status was obtained by linkage to the Australian National Death Index (NDI). The Australian National Death Index is a database housed at the Australian Institute of Health and Welfare, which contains records of all deaths occurring in Australia since 1980. Data are obtained from the registries of births, deaths, and marriages in each Australian state and territory. The following variables for each deceased patient were identified: name, date of birth (or estimated year of birth), age at death, gender, date of death, state/territory of registration, and registration number. Successful matching of patients through this linkage process was achieved in 99.4% of patients in the MIG registry. The secondary endpoints were 30-day mortality and major adverse cardiovascular and cerebrovascular events (MACCE). MACCE was defined as the composite of mortality, recurrent myocardial infarction (MI), stent thrombosis, target vessel revascularization, and stroke. The safety end point was in-hospital bleeding.

Recurrent MI was defined as an increase in creatine kinase or creatine kinase-MB ≥3 times the upper limit of normal; and/or a significant ST-segment change, development of new Q waves in ≥2 contiguous electrocardiographic leads, or new left branch bundle block pattern in the context of new clinical symptoms. In-hospital bleeding was defined as bleeding requiring a transfusion and/or prolonged hospital stay and/or a drop-in hemoglobin >3 g/dl. Procedural success was defined by a residual stenosis of <20% in stent procedures with thrombolysis in myocardial infarction 3 flow.

Categorical data have been expressed as numbers or percentages and continuous variables as mean ± standard deviation. Categorical variables were compared using Fisher's exact or chi-square tests as appropriate. Continuous variables were compared using student *t* Test or Kruskal-Wallis equality-of-populations rank test.

Cumulative incidence of mortality was estimated by the Kaplan-Meier method, and the log-rank test was used to evaluate differences between groups. Cox proportion hazard modeling was used to assess for independent predictors of long-term mortality. Univariate variables with $p < 0.10$ were included in our model to obtain adjusted hazard ratios (HR) and 95% confidence intervals (CI). These included DTBT, age, female gender, drug-eluting stents (DES), current smoker, hypertension, ejection fraction <30%, chronic lung disease, renal impairment, cardiogenic shock, out-of-hospital cardiac arrest (OHCA), and symptom-to-balloon time (STBT). The data analysis was carried out by using Stata 15.0 (StataCorp LP, College Station, Texas). A p value of <0.05 was considered to be statistically significant.

Results

Of the 6,179 patients presenting with STEMI included in our study, 1,258 (20.3%) were female and 4,921 (79.7%) were male.

Trends in DTBT over the 13-year study period for men and women are illustrated in Figures 1 and 2. There has been significant improvement in timely revascularization over this period in both cohorts, with a dramatic increase in the <60-minute group (p value for all <0.01).

Baseline characteristics on presentation are shown in Table 1. Female patients were older (69 ± 13 vs 62 ± 12 years), had more co-morbidities and were more likely to present with high risk features such as renal dysfunction, atrial fibrillation, left ventricular dysfunction and multivessel coronary artery disease (CAD) ($p < 0.01$ for all). Male patients were more likely to be current smokers with a personal or family history of CAD ($p < 0.01$ for all) and were more likely to present with OHCA, (12% vs 8%; p value <0.001). Regarding revascularization, STBT and DTBT were longer in female patients (204 vs 181 and 81 vs 75 minutes; $p < 0.001$).

Angiographic and procedural characteristics are shown in Table 2. Women were less likely to receive a DES (39% vs 43%; p = 0.01), had less radial access for PCI (15% vs 21%; $p < 0.001$), and were less likely to have a successful PCI (93% vs 95%; p = 0.04).

Secondary prevention pharmacotherapy for patients who were alive at 12-months is shown in Table 3 (Men: N = 3,270, Women: N = 815). Female patients received less guideline-directed medical therapy than men with less

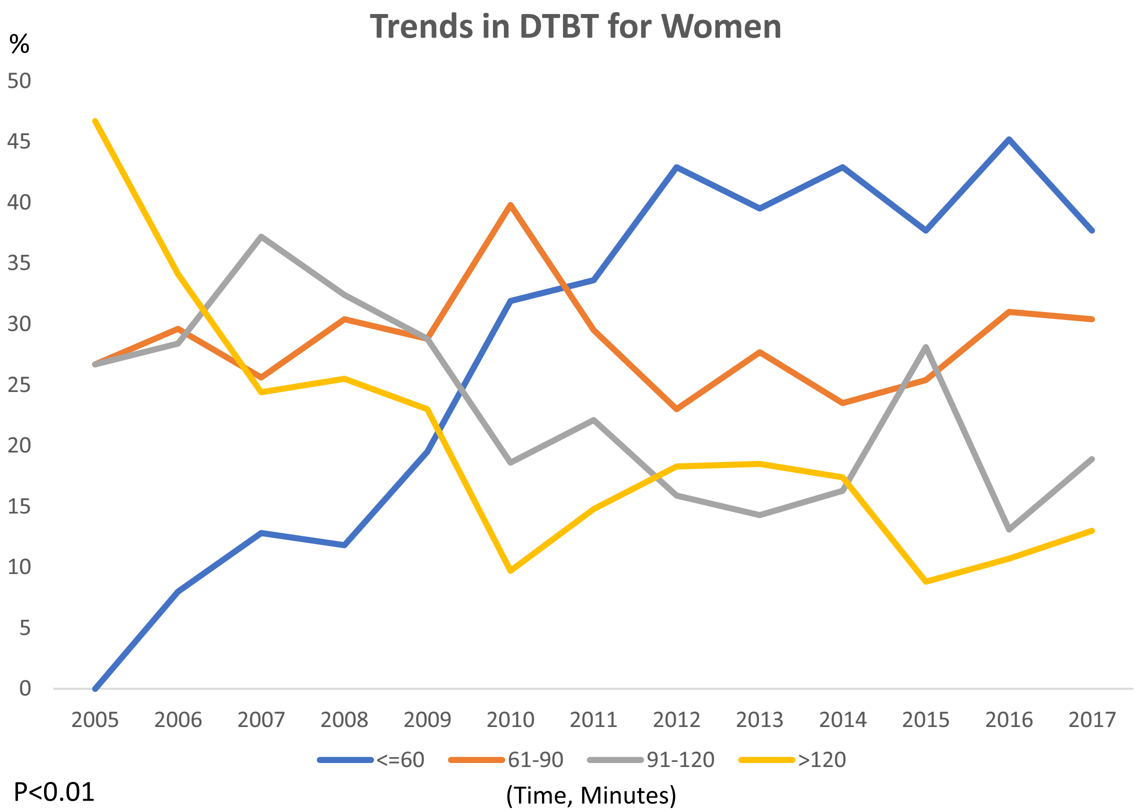

Figure 1. Trends in door-to-balloon time for women (%).

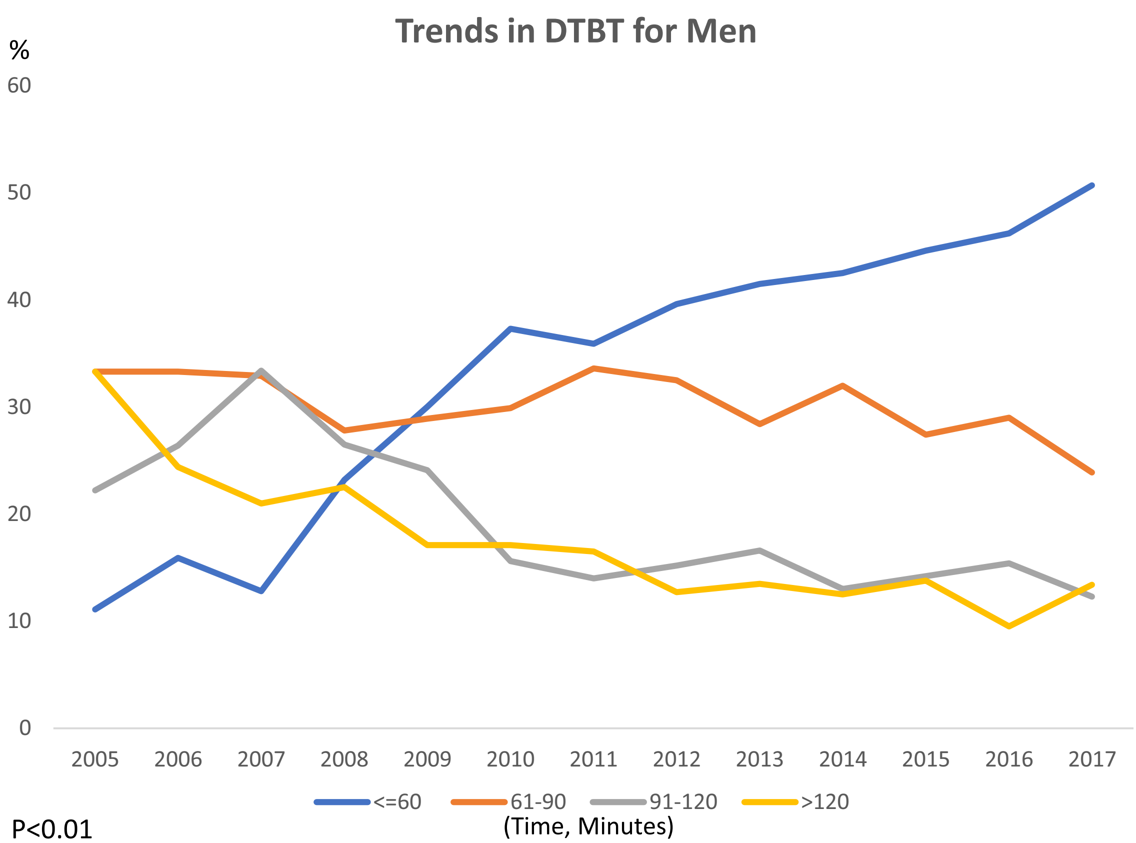

Figure 2. Trends in door-to-balloon time for men (%).

Table 1
Baseline and presentation characteristics

Variable	Men (N = 4,921)	Women (N = 1,258)	P Value
Age (years)	61.5 ± 12.1	69.4 ± 12.7	<0.001
Age ≥75	791 (16.1%)	477 (37.9%)	<0.001
BMI (kg/m$^{2)}$)	27.7 ± 4.6	27.6 ± 6.2	0.60
Current smoker	1,783 (37.2%)	386 (31.4%)	<0.001
Hypertension	2,439 (49.6%)	795 (63.2%)	<0.001
Hypercholesterolemia	2,369 (48.3%)	625 (49.8%)	0.33
Diabetes mellitus	799 (16.3%)	251 (20.0%)	0.002
Family history of CAD	1,588 (34.2%)	364 (30.5%)	0.016
Previous MI	682 (13.9%)	114 (9.1%)	<0.001
Previous PCI	594 (12.1%)	100 (8.0%)	<0.001
Previous CABG	118 (2.4%)	24 (1.9%)	0.30
Congestive heart failure	75 (1.5%)	27 (2.2%)	0.12
Peripheral vascular disease	145 (3.0%)	36 (2.9%)	0.87
Cerebrovascular disease	203 (4.1%)	86 (6.8%)	<0.001
Chronic lung disease	364 (7.4%)	128 (10.2%)	0.001
eGFR≥60 ml/min/1.73 m^2	3,347 (75.9%)	695 (60.7%)	<0.001
eGFR 30-<60 ml/min/1.73 m^2	929 (21.3%)	397 (34.7%)	<0.001
eGFR<30 ml/min/1.73 m^2	79 (1.8%)	53 (4.6%)	<0.001
Congestive heart failure (<2/52)	291 (5.9%)	82 (6.5%)	0.42
Atrial fibrillation	229 (5.4%)	86 (7.9%)	<0.001
Killip Class ≥2	1,090 (23.1%)	292 (23.9%)	0.56
Cardiogenic shock	559 (11.4%)	167 (13.3%)	0.06
Out of hospital cardiac arrest	587 (11.9%)	102 (8.1%)	<0.001
STBT (mean ± SD)	218 ± 120	240 ± 125	<0.001
Door-to-balloon time (minutes)(mean± SD)	87 ± 62	93 ± 62	<0.001
≤90	3,126 (65.4%)	714 (58.4%)	<0.001
≤60	1,711 (35.8%)	374 (30.6%)	<0.001
61-90	1,438 (30.1%)	350 (28.6%)	<0.001
91-120	878 (18.4%)	276 (22.6%)	<0.001
>120	755 (15.8%)	223 (18.2%)	<0.001
MICA-activated MI	1,325 (49.7%)	330 (53.1%)	0.14

BMI, body mass index; CAD, coronary artery disease; CABG, coronary artery bypass graft; DTBT, door-to-balloon-time; eGFR, estimated glomerular filtration rate; MI, myocardial infarction; MICA, mobile intensive care ambulance; PCI, percutaneous coronary intervention; STBT, symptom-to-balloon time.

prescription of aspirin (93% vs 95%; p = 0.02), statins (96% vs 98%; p < 0.05), and beta blockers (84% vs. 89%; p < 0.001).

In-hospital, 30-day and long-term outcomes are shown in Table 4. Unadjusted mortality rates at all 3 DTBT time-points were higher in women (8.8% vs 6.2%, 9.8% vs 6.9%, 27.1% vs 16.5%; p < 0.001 for all) (Figures 3−5). Furthermore, 30-day recurrent MI (3.0 vs 1.7%; p = 0.002), stroke (1.4% vs 0.7%; p = 0.01), and MACCE (14.4% vs 11.1%; p = 0.001) was higher in female patients.

Table 5 shows independent predictors of long-term mortality. Age, left ventricular dysfunction, renal impairment, lung disease, cardiogenic shock, and OHCA at presentation were strong predictors of mortality (p < 0.001 for all). Furthermore, being a current smoker (HR 1.43, 95% CI 1.18 to 1.75; p < 0.001) and hypertension (HR 1.27, 95% CI 1.07 to 1.51; p = 0.005) were associated with higher mortality, and the use of DES was associated with a lower risk of death (HR 0.80, 95% CI 0.67 to 0.95; p = 0.01). STBT was an independent predictor of higher mortality (HR 1.00, 95% CI 1.00002 to 1.001; p = 0.04), although DTBT did not reach statistical significance (DTBT <60 minutes, p = 0.09, DTBT 61 to 90 minutes, p = 0.06, DTBT 91 to 120 minutes, p = 0.64). Gender was not an independent predictor of long-term mortality (HR 0.99, 95% CI 0.83 to 1.18; p = 0.92) at a mean follow-up of 4.8 ± 3.5 years.

Discussion

From this observational cohort study of patients presenting with STEMI who are treated with PCI, 4 conclusions merit attention. Firstly, women presenting with STEMI are older, have more co-morbidities and are more likely to present with high-risk features. Secondly, despite an overall improvement in timely revascularization over the study period, women present later and have a longer ischemic time than men. Thirdly, women have differing interventional approaches and prescription of medical therapy which stray from guideline recommendations. Lastly, although unadjusted in-hospital and 30-day mortality rates were higher in women, on Cox-proportional hazard modeling, gender was not an independent predictor of long-term mortality.

There is an extensive literature describing gender differences in the clinical presentation and pathophysiology of STEMI that may influence management and outcomes.[4,7,12−16] The characteristics of the patients in our cohort are comparable with those of other Australian and

Table 2
Angiography and primary PCI characteristics

Variable	Men (N = 4,921)	Women (N = 1,258)	p Value
Radial approach	1,043 (21.2%)	189 (15.0%)	<0.001
Femoral approach	3,870 (78.8%)	1,068 (85.0%)	<0.001
GP IIb/IIIa use	3,454 (70.2%)	787 (62.7%)	<0.001
Aspirin	4,849 (98.6%)	1,236 (98.3%)	0.43
Clopidogrel	2,985 (59.2%)	845 (67.7%)	<0.001
Prasugrel	621 (12.3%)	76 (6.0%)	<0.001
Ticagrelor	1,437 (28.5%)	328 (26.3%)	0.54
Ejection fraction >45%	2,925 (63.3%)	742 (63.3%)	0.01
Ejection fraction 30-45%	1,590 (34.4%)	386 (32.9%)	0.01
Ejection fraction <30%	106 (2.3%)	45 (3.8%)	0.01
Number of coronary arteries narrowed:			
1	2,141 (50.3%)	570 (53.6%)	0.003
2	1,188 (27.9%)	313 (29.5%)	0.003
3	764 (18.0%)	144 (13.6%)	0.003
Left main narrowing	162 (3.8%)	35 (3.3%)	0.64
Culprit coronary artery:			
Left main	39 (0.8%)	8 (0.6%)	0.60
Left anterior descending	1,827 (37.1%)	441 (35.1%)	0.17
Left circumflex	486 (9.9%)	102 (8.1%)	0.06
Right	1,858 (37.8%)	544 (43.2%)	<0.001
Vein graft	27 (0.6%)	11 (0.9%)	0.19
ACC/AHA lesion classification B2/C	3,489 (70.9%)	900 (71.5%)	0.66
Pre-PCI TIMI flow:			
0	3,179 (64.7%)	804 (64.0%)	0.22
1	259 (5.3%)	82 (6.5%)	0.22
2	513 (10.5%)	141 (11.2%)	0.22
3	960 (19.6%)	229 (18.2%)	0.22
Post-PCI TIMI flow:			
0	102 (2.1%)	43 (3.4%)	0.004
1	34 (0.7%)	16 (1.3%)	0.004
2	174 (3.5%)	36 (2.9%)	0.004
3	4,609 (93.7%)	1,162 (92.4%)	0.004
Estimated lesion length (mm)	22 ± 10	21 ± 10	0.09
Bare metal stent	2,336 (47.5%)	644 (51.2%)	0.02
Drug eluting stent	2,099 (42.7%)	487 (38.7%)	0.01
Mixed DES and BMS (culprit)	29 (0.59%)	6 (0.48%)	0.64
Thrombo-aspiration use	1,137 (26.3%)	237 (21.6%)	0.002
Successful PCI	4,667 (94.9%)	1,174 (93.3%)	0.04

ACC/AHA = American College of Cardiology/American Heart Association; CAD = coronary artery disease; GP = glycoprotein; LAD = left anterior descending; LCx = left circumflex; PCI = percutaneous coronary intervention; RCA = right coronary artery; TIMI = thrombolysis in myocardial infarction score.

international studies which show that women who present with acute coronary syndromes (ACS) are older with a greater burden of medical co-morbidities.[6,16,17] In contrast, men were more likely to be smokers and to have a history of CAD. At every level of risk, women are less likely than men to receive guideline-mandated management for STEMI.[6] By restricting our analyses to patients presenting with STEMI, we minimized the effects of differences in management due to type of ACS and risk level. Regardless, the reasons for these persisting differences do not seem medically justified.

Rapid mechanical reperfusion is an established treatment for patients presenting with STEMI, irrespective of gender.[18] This is supported by international guidelines and is founded on the principle that reducing ischemic time will decrease myocardial necrosis and limit infarct size.[1,19] Multiple large-scale studies have demonstrated a gender discrepancy in the presentation and acute management of ACS, with women being more likely to present later, with atypical symptoms and have significant delays to revascularization.[4,6,17] Similar findings have been observed in a STEMI cohort.[6] Consistent with these studies, we found that women had a greater total ischemic time, with longer STBT and DTBT than their male counterparts. Interestingly, STBT but not DTBT was independently associated with increased long-term mortality. This likely reflects the relatively small proportion of total ischemic time represented by DTBT.[20] Reduction in the STBT for women, through improved symptom recognition and access to medical care represents an opportunity to reduce total ischemic time and, consequently, long-term mortality.[20]

Despite an overall improvement in timely revascularization over the study period, sex differences still persist in STBT, DTBT, and revascularization technique. Women were significantly less likely to have a radial access or receive a DES, and overall had significantly lower rates of

Table 3
Medications

	Men (N = 4,921)	Women (N = 1,258)	p Value
Medications at 30-days:			
Aspirin	4,245 (97.1%)	1,061 (97.3%)	0.64
Clopidogrel/Prasugrel/Ticagrelor	4,231 (96.8%)	1,048 (96.3%)	0.48
Statin	4,252 (97.6%)	1,045 (96.5%)	0.05
Beta-blocker	3,898 (89.4%)	913 (84.3%)	<0.001
ACE/ARB	3,864 (88.6%)	938 (86.4%)	0.04
Warfarin/NOAC	502 (11.5%)	121 (11.2%)	0.78
Spironolactone/Eplerenone	294 (7.3%)	81 (8.3%)	0.30
Ezetimibe	96 (2.4%)	21 (2.2%)	0.67
Fibrate	36 (0.9%)	9 (0.9%)	0.93
	Men (N = 3,270)	Women (N = 815)	p Value
Medications at 12-months:			
Aspirin	3,121 (95.4%)	761 (93.4%)	0.02
Clopidogrel/Prasugrel/Ticagrelor	2,338 (71.9%)	572 (70.5%)	0.43
Statin	3,119 (96.1%)	731 (90.7%)	<0.001
Beta-blocker	2,652 (82.2%)	624 (77.5%)	0.002
ACEi/ARB	2,771 (85.7%)	676 (83.9%)	0.18
Warfarin/NOAC	190 (5.9%)	58 (7.1%)	0.18
Spironolactone/Eplerenone	200 (6.4%)	58 (7.4%)	0.30
Ezetimibe	132 (4.2%)	34 (4.3%)	0.88
Fibrate	40 (1.3%)	3 (0.4%)	0.03

ACEi = angiotensin converting enzyme-inhibitor; ARB = angiotensin II receptor blocker; NOAC = novel oral anticoagulant.

successful PCI. On Cox proportional hazard modeling, the use of DES was associated with a lower risk of death highlighting the importance of adherence to best medical practice. Furthermore, women were less likely to receive guideline-directed medical therapy at 30-days and 12-months post STEMI. Whether this is related to their advanced age or medical co-morbidities remains unclear. As such, further detailed qualitative assessment is needed to understand the reasoning behind variances in the acute management of STEMI.

The prognostic significance of gender in patients presenting with STEMI is poorly understood. It is well established that women have worse outcomes following ACS although this is often attenuated after adjusting for clinical characteristics.[21,22] Of note, in our study although women had a higher absolute early mortality, reassuringly, female

Table 4
Outcomes in patients stratified by gender

	Men (N = 4,921)	Women (N = 1,258)	p Value
In-hospital outcomes			
Emergency PCI	51 (1.0%)	12 (1.0%)	0.80
Stent thrombosis	40 (0.9%)	6 (0.6%)	0.23
Unplanned CABG	72 (1.5%)	15 (1.2%)	0.50
Cardiogenic shock	406 (8.3%)	134 (10.7%)	0.007
Arrhythmia	895 (18.2%)	278 (22.1%)	0.002
Stroke	32 (0.7%)	12 (1.0%)	0.25
New renal impairment	184 (3.8%)	44 (3.5%)	0.69
New heart failure	431 (8.8%)	148 (11.8%)	0.001
Length of stay (days)	5.3 ± 5.7	4.9 ± 3.4	0.46
In-hospital minor bleeding	126 (7.2%)	36 (9.8%)	0.03
In-hospital major bleeding	54 (3.1%)	7 (1.9%)	0.03
In-hospital mortality	306 (6.2%)	111 (8.8%)	0.001
30-day outcomes			
30-day mortality	340 (6.9%)	123 (9.8%)	0.001
30-day MI	83 (1.7%)	38 (3.0%)	0.002
30-day stroke	35 (0.7%)	18 (1.4%)	0.01
30-day MACE	519 (10.6%)	166 (13.2%)	0.008
30-day MACCE	543 (11.1%)	180 (14.4%)	0.001
Long-term outcomes			
Long-term mortality	803 (16.5%)	337 (27.1%)	<0.001

CABG = coronary artery bypass graft; MACCE = major adverse cardiovascular and cerebrovascular events; MACE = major adverse cardiovascular events; MI = myocardial infarction; PCI = percutaneous coronary intervention.

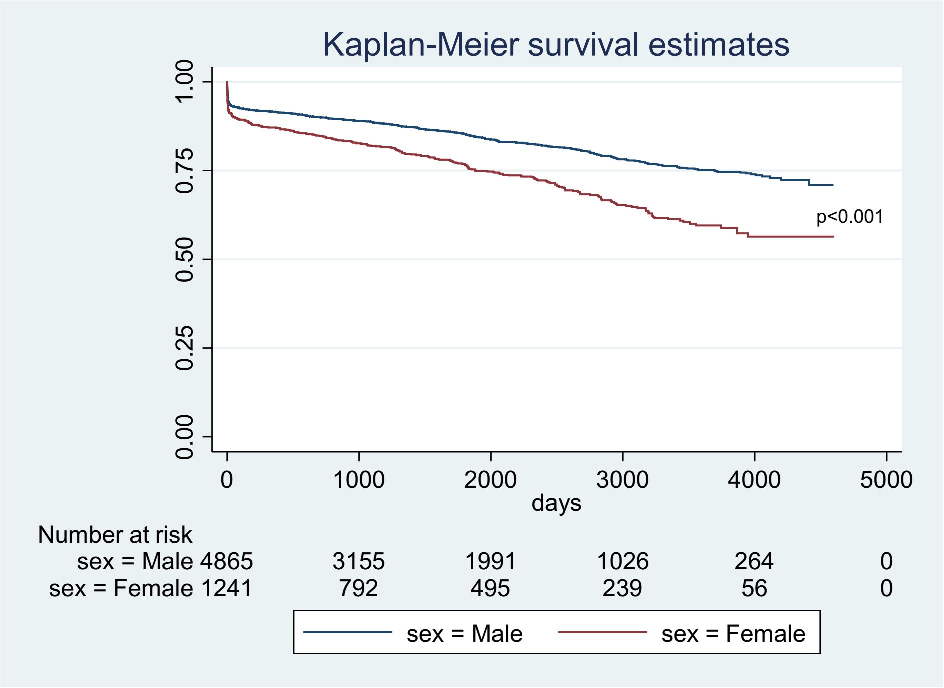

Figure 3. Kaplan-Meier survival curves men vs women.

gender was not an independent predictor of long-term mortality. The relation between mortality and gender is likely affected by a number of variables, including advanced age, additional co-morbidity and disease presentation which contribute to this early mortality hazard. Coronary anatomy may also play a role given women's lesser burden of disease.[7]

This study has a number of inherent limitations due to its observational design. Firstly, there are likely factors we have not accounted for in our analysis, and thus the associations we have reported are hypothesis-generating rather than conclusive. Secondly, the generalizability of our study is limited to only those patients with STEMI who were treated with PPCI. Thirdly, although the registry captures

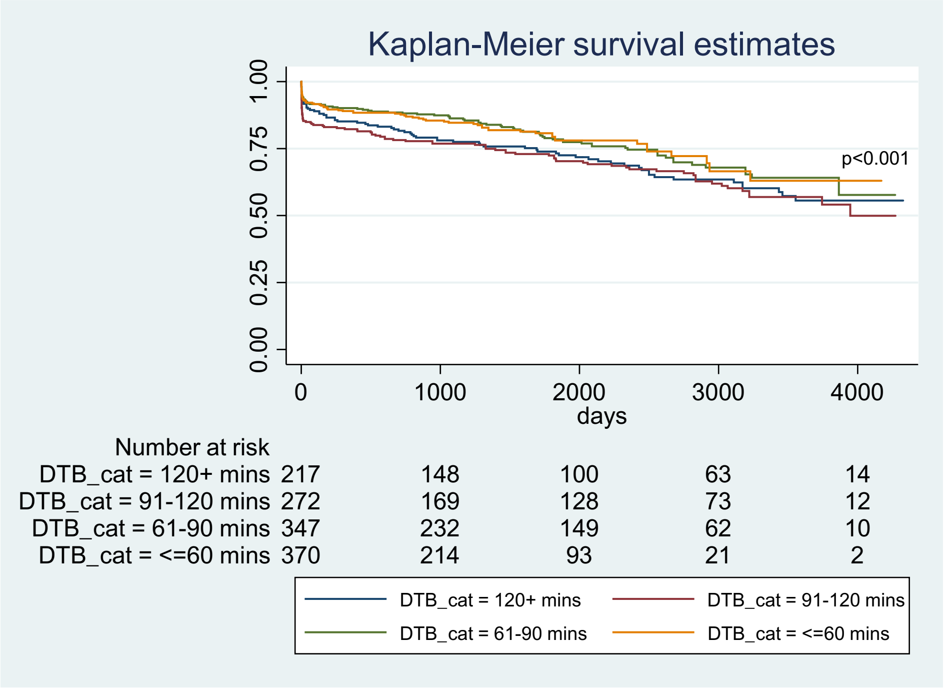

Figure 4. Kaplan-Meier survival curves for women by door-to-balloon time (<60, 61-90, 91-120, >120 minutes).

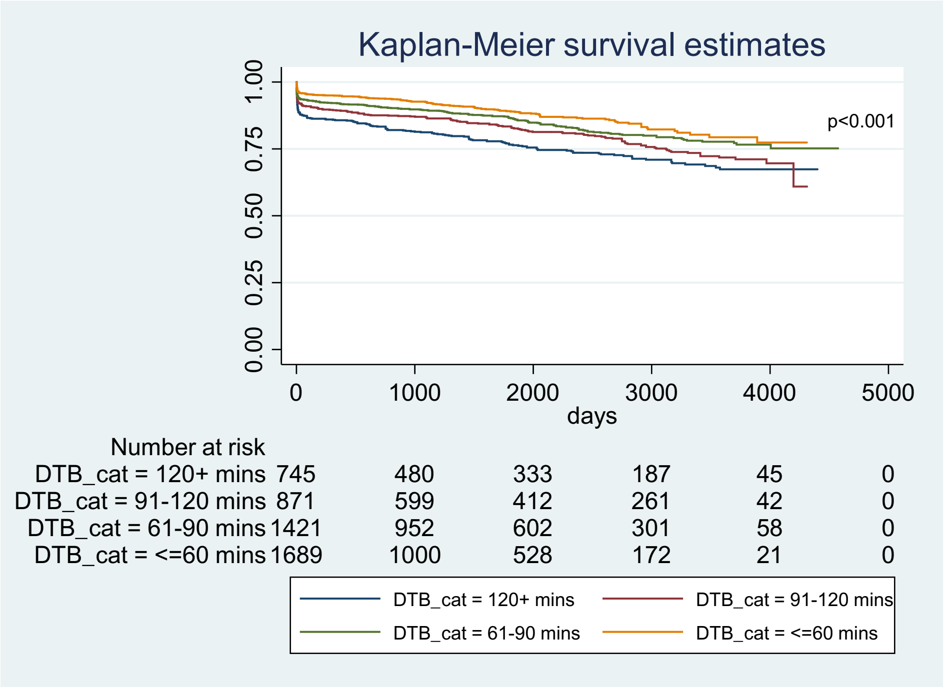

Figure 5. Kaplan-Meier survival curves for men by door-to-balloon time (<60, 61-90, 91-120, >120 minutes).

Table 5
Multivariate predictors of long-term mortality including gender and door-to-balloon time categories

	Hazard ratio	95% CI	p Value
DTBT#####91-120 minutes	0.95	0.75−1.18	0.64
DTBT#####61-90 minutes	0.80	0.64−1.00	0.06
DTBT#####<60 minutes	0.80	0.63−1.03	0.09
Age (per year)	1.06	1.05−1.08	<0.001
Female sex	0.99	0.83−1.18	0.92
DES	0.80	0.67−0.95	0.01
Current smoker	1.43	1.18−1.75	<0.001
Hypertension	1.27	1.07−1.51	0.005
EF <30%	1.87	1.64−2.12	<0.001
Chronic lung disease	1.71	1.38−2.11	<0.001
eGFR 30-60	1.62	1.36−1.93	<0.001
eGFR <30	3.46	2.50−4.80	<0.001
Cardiogenic shock	2.27	1.84−2.82	<0.001
Out of hospital cardiac arrest	2.04	1.62−2.56	<0.001
Symptom-to-balloon time	1.0007	1.00002 − 1.001	0.04

DES = drug-eluting stent; DTBT = door-to-balloon-time; eGFR = estimated glomerular filtration rate; EF = ejection fraction.

utilization of secondary prevention therapies, we do not know whether patients are achieving optimal blood pressure, cholesterol, and diabetic control or the reasoning behind under-utilization of therapies.

In conclusion, women had longer ischemic times, higher risk profiles, and differing treatment compared with men which was associated with a worse outcome. Addressing these gender inequalities with early identification of symptoms, greater radial access and use of DES, in addition to optimal guideline-directed medical therapies has the potential to further improve outcomes in women with STEMI.

Disclosures

The authors have no conflicts of interest to disclose.

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