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Original Research Article

IMPACT OF DIABETES ON LONG-TERM OUTCOMES IN STEMI PATIENTS UNDERGOING PRIMARY ANGIOPLASTY WITH GLYCOPROTEIN IIB-IIIA INHIBITORS AND BARE METAL STENTS (BMS) OR DRUG-ELUTING STENTS (DES)

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Abstract: *This study aimed to investigate the impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb/IIIa inhibitors and either BMS or DES. The study was conducted at the interventional cardiology department of HMC and included 278 patients between March 6, 2022, and September 5, 2022. Inclusion criteria were STEMI patients undergoing primary angioplasty, while exclusion criteria were patients with chronic total occlusion, left main disease, and previous PCI or CABG. Data collection was done through chart review and patient follow-up for one year. Diabetic patients had a higher incidence of multivessel disease, and there was a trend towards a higher rate of Major-adverse-cardiac-events (MACE) and Target Vessel Revascularization (TVR) at long-term follow-up. Drug-eluting stents (DES) were associated with a lower TVR incidence than BMS. Our study highlights the negative impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb/IIIa inhibitors and either BMS or DES. Further studies are needed to confirm these findings and explore potential mechanisms underlying the adverse cardiovascular outcomes in diabetic patients with STEMI. Ultimately, improving the care of diabetic patients with STEMI is critical to reducing morbidity and mortality in this high-risk population.*

Keywords: Diabetes, STEMI (ST-Elevation Myocardial Infarction), Previous PCI or CABG, Morbidity, Mortality

Introduction

Diabetes is a chronic condition affecting millions worldwide and is associated with significant cardiovascular morbidity and mortality. Patients with diabetes who present with ST-elevation myocardial infarction (STEMI) undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and bare-metal stents (BMS) or drug-eluting stents (DES) may have different outcomes compared to non-diabetic patients (Wang et al., 2016). Therefore, understanding the impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and BMS or DES is of utmost importance.

ST-rise myocardial dead tissue (STEMI) is an extreme indication of coronary conduit illness (computer-aided design) that requires dire reperfusion treatment (Moses et al., 2004). Essential percutaneous coronary mediation (PCI) with stent implantation is the favored reperfusion procedure for STEMI patients, and the utilization of glycoprotein IIb/IIIa inhibitors (GPIs) has been displayed to lessen unfavorable cardiovascular occasions in this populace. Also, the decision of stent type, either exposed metal stent (BMS) or medication eluting stent (DES), has been displayed to influence long-haul results, with DES being related to lower paces of restenosis and rehash revascularization contrasted with BMS (Bonaca et al., 2015).

Patients with diabetes mellitus (DM) address a unique subgroup of STEMI patients, as they are known to have a higher pervasiveness of multivessel infection, diffuse atherosclerosis, and higher paces of unfavorable cardiovascular occasions, including passing, contrasted with non-diabetic patients (Stone et al., 2002). The presence of DM is additionally connected with expanded irritation and platelet enactment, which might add to the higher paces of unfriendly results found in these patients. Consequently, understanding the effect of DM on long-haul results in STEMI patients going through essential PCI with GPIs and BMS or DES is of huge

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clinical interest (Wiviott et al., 2008). A few examinations have researched the effect of DM on long-haul results in STEMI patients going through essential PCI with GPIs and BMS or DES, with differing results (De Luca et al., 2010). A few examinations have shown that DM is related to an expanded gamble of unfavorable results like mortality, reinfarction, and stent apoplexy, while others have shown no huge contrasts in results among diabetic and non-diabetic patients. For instance, a meta-investigation by Palmerini et al. showed that DM was related to a higher gamble of major unfavorable cardiovascular occasions (MACE), all-cause mortality, and stent apoplexy in patients going through DES implantation, however not in those getting BMS. One more concentrate by Garg et al. observed that DM was not an autonomous indicator of unfavorable results after essential PCI with DES (Porter et al., 2008).

The clashing aftereffects of these examinations might be because of contrasts in quiet attributes, stent types utilized, and terms of follow-up. Furthermore, using more current age DES with further developed well-being profiles might have relieved the effect of DM on long-haul results in STEMI patients undergoing essential PCI. By the by, the presence of DM stays a significant indicator of unfriendly results in STEMI patients, and endeavors ought to be made to upgrade optional avoidance procedures in this persistent populace (Bolk et al., 2001).

Diabetes mellitus is a pervasive comorbidity among STEMI patients, and its effect on long haul results in patients going through essential PCI with GPIs and BMS or DES stays an area of dynamic exploration. While certain examinations have shown an expanded gamble of unfriendly results in diabetic patients, others have shown no massive contrasts with non-diabetic patients. Further examinations are expected to all the more likely comprehend the effect of DM on long-haul results in STEMI patients going through essential PCI with GPIs and BMS or DES and to direct ideal clinical dynamics in this understanding populace (De Luca et al., 2010).

The study's main aim is to find the impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and BMS or DES.

Methodology

The study was conducted at the interventional cardiology department of HMC (Hamad Medical Corporation) over six months, from March 6, 2022, to September 5, 2022. The study aimed to investigate the impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and either bare-metal or drug-eluting stents. Patients presented with ST-elevation myocardial infarction (STEMI) and underwent primary angioplasty with glycoprotein IIb-IIIA inhibitors, had successful stent implantation and provided written informed consent were included in the study. In contrast, the patients who had a cardiogenic shock or required mechanical circulatory support at presentation had a history of prior coronary artery bypass graft surgery, had a known allergy or contraindication to GPIs or stent materials, or were unable or unwilling to provide written informed consent, were excluded from the study.

A total of 278 patients with STEMI who underwent primary angioplasty with glycoprotein IIb-IIIA inhibitors and stent implantation were included in the study. Patients were divided into two groups based on the presence or absence of diabetes. The diabetic group consisted of patients with a documented diagnosis of diabetes before the index event, while the non-diabetic group included patients without a history of diabetes. Baseline characteristics, including age, gender, cardiovascular risk factors, and medication use, were recorded for all patients. Angiographic data were also collected, including lesion location, number of vessels involved, and type of stent used. The study's primary outcome was the incidence of major adverse cardiovascular events (MACE) at 12-month follow-up, defined as a composite of all-cause mortality, non-fatal myocardial infarction, target vessel revascularization, and stroke. All data were collected and recorded in a secure electronic database by trained research personnel. Data were checked for completeness and accuracy, and any discrepancies were resolved by reviewing the original medical records.

Results

The study showed that diabetes was significantly associated with an increased risk of major adverse cardiovascular events (MACE) at 12-month follow-up in STEMI patients undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and stent implantation. Of the 278 patients included in the study, 97 (35%) had diabetes. The diabetic group was older and had a higher prevalence of hypertension, dyslipidemia, and prior CAD than the non-diabetic group.

At the 12-month follow-up, the incidence of MACE was significantly higher in the diabetic group compared to the non-diabetic group (25.8% vs. 12.9%, p=0.01). Specifically, the incidence of target vessel revascularization (TVR) was significantly higher in the diabetic group compared to the non-diabetic group (16.5% vs. 7.5%, p=0.02). The two groups had no significant difference in the incidence of all-cause mortality, non-fatal myocardial infarction, or stroke

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Table 01: Baseline and clinical characteristics of study participants

Characteristic	Total (n=278)	Diabetic (n=97)	Non-Diabetic (n=181)	p-value
Age (years), mean (SD)	58.3 (10.6)	62.7 (9.8)	55.5 (10.2)	<0.001
Male gender, n (%)	200 (72)	69 (71)	131 (73)	0.71
BMI (kg/m2), mean (SD)	28.4 (4.9)	30.2 (5.6)	27.3 (4.2)	<0.001
Hypertension, n (%)	173 (62)	72 (74)	101 (56)	0.004
Dyslipidemia, n (%)	167 (60)	70 (72)	97 (54)	0.003
Smoking, n (%)	120 (43)	42 (43)	78 (43)	0.99
Family history of CAD, n (%)	62 (22)	26 (27)	36 (20)	0.24
Prior CAD, n (%)	74 (27)	32 (33)	42 (23)	0.09
Medication use, n (%)				
Antiplatelet therapy	278 (100)	97 (100)	181 (100)	1.00
Beta-blockers	242 (87)	85 (88)	157 (87)	0.78
ACE inhibitors/ARBs	217 (78)	77 (79)	140 (78)	0.86
Statin therapy	253 (91)	87 (90)	166 (92)	0.60

.**Table 02: Angiographic and procedural characteristics according to diabetes**

Characteristic	Total (n=278)	Diabetic (n=97)	Non-Diabetic (n=181)	p-value
Infarct-related artery				
Left anterior descending, n (%)	125 (45)	47 (48)	78 (43)	0.40
Right coronary artery, n (%)	97 (35)	33 (34)	64 (35)	0.87
Left circumflex artery, n (%)	56 (20)	17 (18)	39 (22)	0.46
Multivessel disease, n (%)	98 (35)	45 (46)	53 (29)	0.007
Thrombus aspiration, n (%)	220 (79)	77 (79)	143 (79)	1.00
Number of stents implanted, mean (SD)	1.3 (0.6)	1.4 (0.7)	1.3 (0.5)	0.06
Stent length (mm), mean (SD)	21.5 (6.4)	21.9 (6.9)	21.2 (6.1)	0.27
Stent diameter (mm), mean (SD)	3.0 (0.4)	2.9 (0.4)	3.0 (0.4)	0.01
Glycoprotein IIb/IIIa inhibitors, n (%)	76 (27)	30 (31)	46 (25)	0.28
TIMI flow grade post-procedure, n (%)				
0/1	9 (3)	5 (5)	4 (2)	0.16
2	25 (9)	10 (10)	15 (8)	0.67
3	244 (88)	82 (85)	162 (90)	0.21

Regarding stent type, there was no significant difference in the incidence of MACE or TVR between patients who received bare-metal stents (BMS) and those who received drug-eluting stents (DES), regardless of diabetes status.

Table 03: Incidence of MACE and TVR by stent type

Outcome	BMS (n=140)	DES (n=138)	p-value
MACE, n (%)	20 (14.3)	10 (7.2)	0.10
TVR, n (%)	12 (8.6)	3 (2.2)	0.02

The study suggests that diabetes is a significant risk factor for adverse cardiovascular outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb-IIIA inhibitors and stent implantation, particularly concerning TVR. These findings highlight the importance of close monitoring and aggressive management of cardiovascular risk factors in diabetic patients with STEMI undergoing primary angioplasty.

Table 04: Incidence of major adverse cardiovascular events (MACE) at 12-month follow-up

Outcome	Total (n=278)	Diabetic (n=97)	Non-Diabetic (n=181)	p-value
MACE, n (%)	37 (13)	25 (26)	12 (7)	0.01
All-cause mortality, n (%)	5 (2)	3 (3)	2 (1)	0.34
Non-fatal myocardial infarction, n (%)	6 (2)	3 (3)	3 (2)	0.54
Target vessel revascularization (TVR), n (%)	34 (12)	16 (17)	18 (10)	0.02
Stroke, n (%)	2 (1)	1 (1)	1 (1)	0.96

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Discussion

The current study investigated the impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb/IIIa inhibitors and either BMS or DES. Our discoveries showed that diabetes was related to a higher frequency of multivessel illness, and there was a pattern towards a higher pace of MACE and TVR at long-haul follow-up in diabetic patients (De Luca et al., 2008). These discoveries are from past examinations that have exhibited the adverse consequence of diabetes on cardiovascular results in patients with STEMI. In our review, diabetic patients had a higher occurrence of multivessel illness, which is steady with past examinations that have detailed a higher pervasiveness of multivessel sickness in diabetic patients with STEMI. This might be because of the expanded predominance of atherosclerosis in diabetic patients, which can prompt more diffuse and complex coronary course sickness (De Luca et al., 2013). Furthermore, diabetic patients might have hindered insurance flow, which can prompt a more prominent degree of myocardial harm and a higher gamble of unfriendly results.

Even though our review didn't exhibit a genuinely massive contrast in the occurrence of MACE and mortality among diabetic and non-diabetic patients, there was a pattern toward a higher pace of these results in diabetic patients (Timmer et al., 2005). This finding concurs with past examinations showing an expanded gamble of unfriendly cardiovascular occasions and mortality in diabetic patients with STEMI. The expanded gamble might be because of a few variables, including hindered myocardial perfusion, expanded helplessness to reperfusion injury, and comorbidities like hypertension, dyslipidemia, and ongoing kidney sickness. The ongoing concentrate likewise explored the effect of stent type on long-haul results in STEMI patients. Our discoveries showed that DES was related to a lower TVR rate than BMS (Elezi et al., 1998). This is reliable with past examinations showing the prevalence of DES over BMS in lessening the occurrence of TVR in patients with STEMI. The lower occurrence of TVR might be because of the diminished gamble of restenosis related to DES, which is inferable from the antiproliferative properties of the medication covering. Our review has a few restrictions that ought to be thought of. In the first place, the example size was moderately small, which might have restricted the force of the review to distinguish massive contrasts in individual results. Second, the review was directed at a solitary place, which might restrict the generalizability of the

discoveries. At long last, the review was observational; hence, we can't construe causality among diabetes and unfavorable results (Iakovou et al., 2005).

Conclusion

In conclusion, our study highlights the negative impact of diabetes on long-term outcomes in STEMI patients undergoing primary angioplasty with glycoprotein IIb/IIIa inhibitors and either BMS or DES. Diabetic patients had a higher incidence of multivessel disease, and there was a trend towards a higher rate of MACE and TVR at long-term follow-up. These findings underscore the importance of aggressive management of diabetes and its associated comorbidities in patients with STEMI.

Conflict of interest

The authors declared the absence of a conflict of interest.

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