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Comparison of Clinical Outcomes of Primary Percutaneous Interventions in Acute Myocardial Infarction among Diabetic Versus Non-Diabetic Patients with Particular Reference to MACCE Outcomes: A Cross-Sectional Comparative Study

Dr Anand Sekar G[1*], Dr. Rajesh M[2]

[1]Associate Professor, Department of Cardiology, Aarupadai Veedu Medical College, Vinayaka Mission's Research Foundation (VMRF-DU), Puducherry, India (Corresponding author)

[2]Associate Professor, Department of Cardiology, Aarupadai Veedu Medical College, Vinayaka Mission's Research Foundation (VMRF-DU), Puducherry, India

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KEYWORDS

Acute Myocardial Infarction, Diabetes Mellitus, Primary Percutaneous Intervention

ABSTRACT:

Background: Over 30 years, the improving outcomes in patients with diabetes who underwent PCIs have been similar to improvements in patients without diabetes mellitus (DM). Importantly, the risk-adjusted association of DM with long-term death, myocardial infarction, and stroke has decreased in the current era. The present study was undertaken with an aim to compare the clinical outcomes post primary percutaneous coronary interventions (PCI) in diabetics and non-diabetics.

Material and Methods: The present study was conducted among 105 patients with Acute ST elevation myocardial infarction (STEMI) and who underwent PCI, during the period April 2016 to May 2017, as a cross-sectional comparative study. These patients were followed up for primary clinical Major Adverse Cardiac and Cerebral event (MACCE) and repeat hospitalization for clinically significant angina or heart failure up to 6 months from the date of inclusion in the study at regular intervals: at discharge, at one-month, and at 6-month follow-ups. Difference in proportions and means were tested for statistical significance by chi square test and independent sample t test respectively.

Results: Most non-diabetic patients were concentrated in the 51–60 years age group, with 32% (n=16) of diabetic patients and 43.64% (n=24) of non-diabetic patients falling within this range. At the end of six months, the risk of major adverse cardiovascular and cerebrovascular events (MACCE) was significantly higher—3.04 times greater—in diabetic patients with hypertension as a comorbidity compared to non-diabetic patients ($p = 0.014$). Furthermore, among those presenting to the hospital within 180 minutes of symptom onset, diabetic patients exhibited a 4.54-fold significantly higher risk of MACCE than non-diabetic individuals ($p = 0.041$).

Conclusion: Primary PCI treatment option in diabetics is non-inferior to primary PCI in non-diabetics when comparing MACCE outcomes, secondary heart failure, deaths or angina admissions in 6-month follow-up period. PCI complication rates are comparable between the diabetic and the non-diabetic groups.

Introduction

Less is known about the impact of diabetes on early and late clinical outcomes in patients with acute myocardial infarction (AMI) undergoing primary percutaneous coronary interventions (PCI). The major cause of morbidity and mortality in diabetic patients is cardiovascular disease.[1] The presence of diabetes is an independent predictor of early and late mortality after acute ST elevation myocardial infarction (STEMI).[2,3]

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The higher mortality in AMI patients with versus without diabetes may, in part, be due to more extensive coronary atherosclerosis and concomitant comorbid conditions, reduced cardiac reserve, and excessive delay from symptom onset to presentation.[4-6] Diabetes has also been associated with abnormal coronary endothelial function, diminished coronary flow reserve, and impaired ischemic preconditioning,[7-9] all of which may result in abnormal myocardial perfusion. Type 2 diabetics without a prior infarction were at the same risk for myocardial infarction (MI) (20 and 19 percent, respectively) and coronary mortality (15 versus 16 percent) as non-diabetics with a prior MI. The risk of infarction was greatest in diabetics with a prior MI and lowest in non-diabetics without a prior MI (45 and 4 percent, respectively). The aforementioned observations were not dependent on other risk factors like lipid profile, systemic hypertension, and tobacco smoking. Over 30 years, the improving outcomes in patients with diabetes who underwent PCIs have been similar to improvements in patients without diabetes mellitus (DM). Importantly, the risk-adjusted association of DM with long-term death, myocardial infarction, and stroke has decreased in the current era.[10] Patients with DM had significant reduction in in-hospital adverse outcomes over time. Such drops were comparable to those witnessed in patients without DM. With increase in prevalence of non-communicable diseases administration of NSAIDs, β-blockers, angiotensin-converting enzyme (ACE) inhibitors, and stating have also increased proportionately over time. The consequence of DM on survival and survival without revascularization has not changed considerably. Though, the effect of DM on survival free of MI and stroke has decreased significantly, from a hazard ratio (95% CI) of 1.71 (1.51-1.92) to 1.39 (1.20-1.60). The present study was undertaken with an aim to determine if diabetics perform as well as, or better than, non-diabetics with the latest intervention guidelines for primary percutaneous intervention and with the advent of newer anti-platelets, statins, angiotensin converting enzyme (ACE) inhibitors/ angiotensin receptor blockers (ARB), Beta blockers, Gp IIb/IIIa inhibitors, and novel anti-diabetic medications.

Material and Methods

The present study was conducted among 105 patients with Acute STEMI and who underwent PCI, during the period April 2016 to May 2017, as a cross-sectional comparative study, in the Institute of Cardiovascular Diseases of the Madras Medical Mission Hospital, which is a 300-bed tertiary care center. It is located in the metropolitan city of Chennai and attracts patients from Tamil Nadu, Southern Andhra Pradesh, Kerala, Karnataka. All patients undergoing Primary PCI with DES for acute myocardial infarction with the following features were included in the study; (i) Presenting with the onset of symptoms within 12 hours; (ii) ECG showing ≥ 1-mm ST-segment elevation in at least 2 anatomically contiguous limb leads, ≥ 1-mm ST-segment elevation in a precordial lead V4 through V6, ≥ 2-mm ST-segment elevation in V1 through V3 or a new left bundle branch block. Patients with PCI with BMS, Prior PCI / Coronary Artery Byepass Graft (CABG) and Patients with chronic kidney disease (CKD) stage III or more are excluded from the study. Minimum required sample size was estimated to be 100, considering a 7% difference in TIMI Grade Flow percentage between the diabetic and the non-diabetic population in the study by Jensen LO et al[11] for an assumed alpha error of 5% and power of 80%, using the formula: $n = p\% \times q\% \times [z/e\%]^2$.

All patients were pretreated with loading dose of Aspirin 325 mg chewable tablets and Clopidogrel 600 mg or Prasugrel 60 mg or Ticagrelor 180 mg (as per the discretion of the treating cardiologist). They were taken up for Primary PCI either via Femoral or Radial artery (as per the cardiologist's discretion). Upon starting the primary PCI procedure, the patients were given Heparin alone or Heparin with GP II b/IIIa inhibitors or Bivalirudin alone as per the cardiologist's discretion. Before commencing the procedure, two standard projections of the right and left coronary angiograms were taken. TIMI flow and Thrombus grades prior to the procedure and TIMI flow grade post-procedure were done. Primary PCI was done by a team consisting of two experienced interventional cardiologists, a Cath lab technician, Cath lab physician assistant, Cath lab nursing personnel. The TIMI flow and thrombus grades were as per the consensus of the Primary PCI team. The angiography parameters assessed were morphology of the lesion, coronary anatomy, angiographic features of the target lesion, TIMI flow pre-and post-procedure, TIMI thrombus grade. Performance of measures like pre-dilatation, post-dilatation, and choice of stent size, use of anticoagulants (heparin with or without GP IIb/IIIa inhibitors, bivalirudin) were as per the discretion of the

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operators. Intravenous unfractionated heparin was given in the dose of 100 IU /kg bolus followed by repeat dosing if necessary to keep the Activated Clotting Time at 275-300. Eptifibatide in a dose of 180µg/kg bolus over 10 minutes followed by 2 µg/kg/min infusion for 18-24 hours; maintenance dose was reduced to 1 µg/kg/min if creatinine clearance was < 50ml/min. Post-PCI, the patients were shifted to the coronary care units and immediately an ECG was done to see the ST segment resolution. Cardiac enzymes CK-MB, Troponin I were also done. Follow up ECGs were done at 6 and 12 hours. These patients were followed up for primary clinical Major Adverse Cardiac and Cerebral event (MACCE) and repeat hospitalization for clinically significant angina or heart failure up to 6 months from the date of inclusion in the study at regular intervals: at discharge, at one-month, and at 6-month follow-ups. The significant events, repeat admissions, medications during follow-ups were obtained from the outpatient department (OPD), In-patient records and telephone follow-up. The details of the procedure done, the angiographic features, lesion characteristics, stents used were documented. Any repeat procedure done on the patients were followed up and all details as before were entered into the database systematically. The criterion for termination was establishment of flow (TIMI III mostly), or residual stenosis less than 50% in the infarct related artery. A successful procedure was defined as one in which a 20% change in luminal diameter is achieved with the final diameter stenosis <50% without the occurrence of death, acute myocardial infarction, or bypass operation during hospitalization. If it was a single stent, its length was taken as the total stent length. In case of two stents, adding the length of the both stents was taken as a total stent length in mm. The overlapping segment was not deducted because in all cases intracoronary imaging was not performed; by which only overlapping segment could be measured accurately. All the patients were treated with dual anti-platelets which always included Aspirin and one among Clopidogrel or Prasugrel or Ticagrelor. All patients received Statins, Beta blockers, angiotensin Converting Enzyme inhibitors or Angiotensin Receptor Blockers unless they were contraindicated. The primary clinical outcomes were cumulative MACCE events at hospitalization, at one-month and 6-month intervals, that is, the combined outcomes of all cause death, re-infarction, target vessel revascularization, stroke. Death was deemed to be due to cardiac cause unless non-cardiac cause was established clinically or at necropsy. Secondary outcomes measured were repeat hospitalization for Heart Failure and Clinically significant angina. Institute ethical committee clearance was sought and obtained before the study was begun. Informed written consent was obtained from all patients before including them in the study. Difference in proportions and means were tested for statistical significance by chi square test and independent sample t test respectively. A p value <0.05 was considered statistically significant. Data analysis was carried out using SPSS (Statistical Package for Social Sciences) version 22.0.

Results

The majority of patients in both groups were concentrated in the 51–60 years age range, comprising 32% (n=16) of diabetic and 43.64% (n=24) of non-diabetic patients. The mean age was 57.05 years among diabetics and 54.36 years among non-diabetics. Males represented 87.27% (n=48) of the diabetic group and 90% (n=45) of the non-diabetic group. A higher proportion of diabetic patients were classified as overweight or obese compared to non-diabetics. There were no statistically significant differences between the groups regarding ECG localization, coronary dominance, or Left Ventricular Ejection Fraction (LVEF) (Table 1). Similarly, no significant differences were observed in the laboratory parameters analyzed (Table 2).

A statistically significant difference was noted in pre-dilatation rates, with 94.55% (n=52) of diabetics undergoing the procedure compared to 76% (n=38) of non-diabetics ($p < 0.05$). Thrombosuction was more frequently performed in the non-diabetic group (26%, n=13) than in the diabetic group (12.73%, n=7). Stent characteristics were comparable between groups. Post-stent dilatation was carried out in 81.82% (n=45) of diabetic patients and 72% (n=36) of non-diabetic patients (Table 3).

At the six-month follow-up, diabetic patients with hypertension had a 3.04-fold significantly higher risk of major adverse cardiovascular and cerebrovascular events (MACCE) compared to non-diabetic patients ($p = 0.014$). Additionally, among patients presenting to the hospital within 180 minutes of symptom onset, diabetics

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exhibited a 4.54-fold significantly higher risk of MACCE than their non-diabetic counterparts (p = 0.041) (Table 5). Heart failure was reported in one diabetic patient at the one-month follow-up and in two patients at six months; no such events were observed in the non-diabetic group.

Kaplan-Meier survival analysis indicated no statistically significant difference in overall survival times between the groups (log-rank test, p = 0.21). The six-month Kaplan-Meier estimated survival probability for heart failure was 1.00 in the non-diabetic group and 0.95 in the diabetic group, while for MACCE, the survival probabilities were 0.62 and 0.67, respectively (Figure 1).

Discussion

In the present study, 105 consecutive patients (55 diabetics and 50 nondiabetics), who underwent primary PCI for acute MI were recruited as per inclusion and exclusion criteria over a period of one year from April 2016 to April 2017. All patients underwent primary PCI at the cardiologist's discretion and were followed for six months without any drop-out at three pre-specified stages, namely, at discharge, at one-month, and 6-month follow-ups.

The onset of symptoms to hospital time was 240 minutes in the non-diabetics and 221.82 minutes in the diabetics. Though the p-value was not significant, the diabetic patients had relatively less symptoms to hospital time. This is in contrast to most studies that show prolonged symptoms to hospital time due to silent ischemia in diabetics that occur because of autonomic dysfunction. This may be of the fact that atypical symptoms could have been ignored by many patients. More patient education and public awareness are needed to address the atypical anginal symptoms early, for possible early intervention. For patients who initially arrive at or are transported to a non-PCI capable hospital, the first medical contact-to-device time should be 120 minutes or less. For patients who initially arrive at or are transported to a PCI-capable hospital, the first medical contact-to-device time should be 90 minutes or less. The mean CK-NAC distribution was 527.94 U/L in the non-diabetic patients and 708.09 U/L in the diabetic patients. The mean CK-MB distribution was 42.56 U/L in the non-diabetic patients and 38.62 U/L in the diabetic patients. The mean troponin I distribution was 10.27 ng/ml in the non-diabetic patients and 15.21 ng/ml in the diabetic patients. There was statistically no significance in relation to cardiac enzyme parameters. This is in contrast to Patel PM et al[12] study that had shown that cardiac markers like C-RP, lipid profile, CK-MB, and SGOT levels were significantly increased in patients suffering from myocardial infarction with diabetes mellitus compared to patients of myocardial infarction without diabetes mellitus. One patient in the non-diabetic group had septicemia triggered primary VT that responded to DC shock and Cordarone. One patient in the non-diabetic group had atrial fibrillation during the procedure that responded to anti-arrhythmics in due course of time. One patient in the diabetic group had LV apical clot for which he was put on an anticoagulation with a single anti-platelet.

At one-month follow-up, the non-diabetic group had two MACCE events in the form of two deaths (4%). The diabetic group had 2 deaths at 1-month follow-up (3.64%) and re-PCI/CABG and re-infarction (1.82%). Short term MACCE outcomes were comparable between the diabetics and the non-diabetics. Our short term MACCE events in diabetics were less when compared to similar studies. In a study done by Brener SJ et al[13] the diabetics had 4.46% deaths versus 1.82% in the non-diabetics, 2.47% re-infarction in diabetics versus 1.78% in the non-diabetics, 3.21% repeat revascularization in the diabetics versus 2.36% in the non-diabetics, 0.97% stroke in the diabetics versus 0.46% in the non-diabetics. In a study done by Demir I et al[14] the diabetics had 8.5% deaths versus 3.6% in the non-diabetics, 4.9% re-infarction in the diabetics versus 1.4% in the non-diabetics, 5.6% repeat revascularization in the diabetics versus 1.6% in the non-diabetics. Similar comparable results were published by Timmer JR et al[15] and Sandias EA et al.[16] The non-diabetic group had 2 deaths as MACCE events at 6-month follow-up (4%). The diabetic group had 4 deaths and 4 re-interventions (re-PCI/CABG) as MACCE events at 6-month follow-up (7.27%) and also re-infarction in two patients (3.64%). The six-month MACCE outcomes were also comparable between diabetics and non-diabetics. Also, the 6-month MACCE outcomes were less compared to other relevant studies. In a study done by Katayama et al,[17] the 6-month MACCE events in the form of deaths and re-infarction were 12% and 4% respectively. In a study done by Demir I et al[14] the 6-month MACCE events in the form of deaths, re-infarction and repeat vascularization were

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12%, 11.3% and 12% respectively. Harjai KJ et al[18] also reported in their research work that death among diabetics was 8.1% as compared to 4.2% in non-diabetics. These results were in contrast to that of the observations noted in the present study. The mean CCU stay duration was 1.95 days in non-diabetics that was comparable to 2.02 days in diabetics. The mean hospital stay duration was 4.18 days in the non-diabetics that was comparable to 3.96 days in the diabetics. This was again in contrast to certain studies that mentioned that diabetics needed longer duration of CCU, and hospital stay, possibly related to the more aggressive nature of CAD in a diabetic population. In a study done by Syed AI et al[19] the mean hospital stay duration was 5.54 days in diabetics and 3.67 days in non-diabetics (p-value=0.002). Some of the possible limitations of the study are that the follow up could be done only for six months, and the follow up was only clinical and not angiographical. The choice of stent was not standardized throughout the study duration as it was under prerogative of treating cardiologist. Study population was limited to those who reported to the study department thereby creating a chance of selection bias, however, being a hospital-based study and similar baseline characteristics between the study groups suggest against a chance of selection bias.

Conclusion

Primary PCI treatment option in diabetics is non-inferior to primary PCI in non-diabetics when comparing MACCE outcomes, secondary heart failure, deaths or angina admissions in 6-month follow-up period. The diabetics and the non-diabetics had similar duration of CCU, and hospital stay. PCI complication rates are comparable between the diabetic and the non-diabetic groups. A larger patient population and a longer follow-up period are required for more elaborate statistical analysis.

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Table 1: Comparison of study groups based on baseline characteristics (n=105)

Characteristic	**Non-Diabetic n(%)/μ± SD**	**Diabetics n(%)/μ ± SD**	**Total n(%)**	***P* value**
Age group				
≤ 30 years	1(100.0)	0(0.0)	1(100.0)	0.107
31-40 years	8(80.0)	2(20.0)	10(100.0)	
41-50 years	11(50.0)	11(50.0)	22(100.0)	
51-60 years	16(40.0)	24(60.0)	40 (100.0)	
61-70 years	9(37.5)	15(62.5)	24(100.0)	
> 70 years	5(62.5)	3(37.5)	8(100.0)	

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Gender				
Male	45(48.4)	48(51.6)	93(100.0)	0.984
Female	5(41.7)	7(58.3)	12(100.0)	
BMI				
18.5 - 24.99 (Normal)	36(76.6)	11(23.4)	47(100.0)	<0.001
25 - 29.99 (Overweight)	8(18.6)	35(81.4)	43(100.0)	
30-34.99 (Obese)	6(40.0)	9(60.0)	15(100.0)	
Comorbidities				
Hypertension	15(68.5)	24(61.5)	39(100.0)	0.074
Hypercholesterolemia	8(72.7)	3(27.3)	11(100.0)	0.078
COPD / BA	4(80.0)	1(20.0)	5(100.0)	0.137
GID	1(100.0)	0(0.0)	1(100.0)	NA
Hypothyroidism	1(33.3)	2(66.7)	3(100.0)	
Onset to hospital	240±185	222±137		0.566
DTOB	42.5±46.7	48.2±78.3		0.657
Ischemic time	279±186	264±177		0.687
Kilip's Classification				
Killip Class 1	45(48.9)	47(51.1)	92(100.0)	0.735
Killip Class 2	4(44.4)	5(55.6)	9(100.0)	
Killip C;lass 3	1(25.0)	3(75.0)	4(100.0)	
ECG localization				
AWMI	14(35.0)	26(65.0)	40(100.0)	0.229
ASMI	2(50.0)	2(50.0)	4(100.0)	
IWMI	31(55.4)	25(44.6)	56(100.0)	
IPWMI	3(60.0)	2(40.0)	5(100.0)	
Dominance				
RCA	43(46.7)	49(53.3)	92(100.0)	0.632
LCX	6(60.0)	4(40.0)	10(100.0)	
Co dominant	1(33.3)	2(66.7)	3(100.0)	
Number of vessels involved				
One	34(52.2)	35(47.8)	69(100.0)	0.643
Two	9(39.1)	14(60.9)	23(100.0)	

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Three	7(53.8)	6(46.2)	13(100.0)	
LVEF				
≤ 40 %	20(43.5)	26(56.5)	46(100.0)	0.450
41-50 %	23(50.0)	23(50.0)	46(100.0)	
51-60 %	6(50.0)	6(50.0)	12(100.0)	
61-70 %	1(100.0)	0(0.0)	1(100.0)	
Total	**50(47.6)**	**55(52.4)**	**105(100.0)**	

COPD – Chronic Obstructive Pulmonary Disease, BA- Bronchial Asthma, AWMI – Anterior Wall MI, ASMI – Antero Septal MI, IWMI – Inferior Wall MI, IPWMI – Inferio Posterior Wall MI, RCA – Right Coronary Artery, LCX – Left Circumflex Artery

Table 2: Comparison of study groups based on laboratory parameters (n=105)

Laboratory Parameter	**Non-Diabetic (µ± SD)**	**Diabetics (µ ± SD)**	***P* value**
Hb (g/dl)	13.77±1.97	12.93±1.69	0.0199
TLC (10X9 cells per cumm)	122.74±46.26	123.16±29.98	0.955
Platelets (per mcl)	2.54±0.67	7.03±3.2	0.329
Sodium (mEq/L)	139.8±3.65	138.8±4.15	0.194
Potassium (mEq/L)	4.17±0.26	4.18±0.24	0.744
Blood Urea (mg/dl)	27.6 ±7.66	29.15±12.36	0.448
Serum Creatinine (mg/dl)	0.91±0.22	0.81±0.30	0.072
TC (mg/dl)	177±45	168±35	0.275
HDL (mg/dl)	37.9±11.7	36.0±7.2	0.324
LDL (mg/dl)	119±46	110±28	0.214
TG (mg/dl)	134±62	155±87	0.169
CK NAC (U/L)	527±670	708±1076	0.311
CK MB (U/L	42.6±74.3	38.6±66.0	0.775
TROPONIN I (ng/ml)	10.3±20.3	15.2±23.3	0.251

Hb- Haemoglobin, TC – Total Count, HDL – High Density Lipoprotein, LDL- Low density lipoprotein, TG- Triglycerides.

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Table 3: Comparison of study groups based on peri procedure parameters of interest (n=105)

Characteristic	Non-Diabetic n(%)/μ± SD	Diabetics n(%)/μ ± SD	Total n(%)	*P* value
Pre Dilatation				
Yes	38(42.2)	52(57.8)	90(100.0)	0.010
No	12(80.0)	3(20.0)	15(100.0)	
Thrombosuction				
Yes	13(65.0)	7(35.0)	20(100.0)	0.134
No	37(43.5)	48(56.5)	85(100.0)	
Stent Characteristics				
Diameter	2.78±0.51	2.85±0.31		0.392
Length	28.82±10.9	32.27±11.8		0.124
Deployment Pressure	10.8±2.7	10.9±2.13		0.818
Post stent dilatation				
Yes	36(44.4)	45(55.6)	81(100.0)	0.253
No	14(58.3)	10(41.7)	24(100.0)	
Pre-Procedure TIMI Grade Flow				
TIMI 0 Flow	38(48.7)	40(51.3)	78(100.0)	0.233
TIMI 1 flow	10(40.0)	15(60.0)	25(100.0)	
TIMI 2 Flow	2(100.0)	0(0.0)	2(100.0)	
Thrombus Grade				
Grade 4	7(35.0)	13(65.0)	20(100.0)	0.198
Grade 5	41(49.4)	42(50.6)	83(100.0)	
Support Devices Used				
TPI	1(25.0)	3(75.0)	4(100.0)	0.735
IABP	4(44.4)	5(55.6)	9(100.0)	
None	45(48.9)	47(51.1)	92(100.0)	
Hospital admission				
CCU stay (in days)	1.96±0.4	2.02±0.41		0.464
Hospital stay (in days)	4.18±1.29	3.96±0.77		0.294
Post procedure TIMI grade flow				
TIMI 1 Flow	1(50.0)	1(50.0)	2(100.0)	0.936

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TIMI 2 Flow	0(0.0)	1(100.0)	1(100.0)	
TIMI 3 Flow	49(48.0)	53(52.0)	102(100.0)	
Myocardial Perfusion grade				
TMP Grade 0	0(0.0)	1(100.0)	1(100.0)	
TMP Grade 2	2(40.0)	3(60.0)	5(100.0)	0.569
TMP Grade 3	48(48.5)	51(51.5)	99(100.0)	
Complications				
None	43(45.3)	52(54.7)	95(100.0)	0.136
Yes	7(70.0)	3(30.0)	10(100.0)	
VT/VF	*3*	*0*	*3*	
Transient Heart Block	*1*	*1*	*2*	
Cardiogenic Shock	*2*	*1*	*3*	
Infection	*1*	*0*	*1*	
AKI	*0*	*1*	*1*	

CCU – Cardiac Care Unit, VT- Ventricular Tachycardia, VF – Ventricular Fibrillation, AKI – Acute Kidney Injury.

Table 4: Comparison of study groups based on MACCE events at various follow up intervals (n=105)

MACCE Events	**Non-Diabetic n**	**Diabetics n**	**Total n**
At hospitalization			
Re-infarction	0	1	1
Re PCI/CABG	2	1	3
Stroke	0	0	0
Death	3	1	4
At one month follow up			
Re-infarction	0	1	1
Re PCI/CABG	0	1	1
Stroke	0	0	
Death	2	2	4
At Six months follow up			
Re-infarction	0	2	2
Re PCI/CABG	0	4	4

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Stroke	0	1	1
Death	2	4	6

Table 5: Multivariate Analysis of Factors Associated with MACCE as determined by Logistic Regression

Variable	**Odds ratio**	**95% CI**	***P*-value**
Age (> 50 years)	3.77	0.94-6.33	0.125
Gender (Male)	2.35	1.37-3.99	0.114
Hypertension	3.04	1.33-6.95	0.014
Smoking	2.45	1.78-3.38	0.045
Hypercholesterolemia	1.10	0.86-1.41	0.062
Smoking	4.02	0.85-6.87	0.102
Onset of Symptoms to Hospital (< 180 mins)	4.54	2.67-7.71	0.041
DTOB (< 30 mins)	1.75	1.04-2.93	<0.001
Ischemic Time (< 240 mins)	3.49	0.88-5.87	0.114
Pre-dilatation	2.00	1.21-3.32	0.224
Thrombosuction	2.07	0.74-3.47	0.683
Post Stent Dilatation	2.15	0.87-3.39	0.680
CCU Stay (> 2 Days)	2.94	0.91-5.05	0.070
Hospital Stay (> 3 Days)	2.43	1.47-4.01	0.011

Heart Function

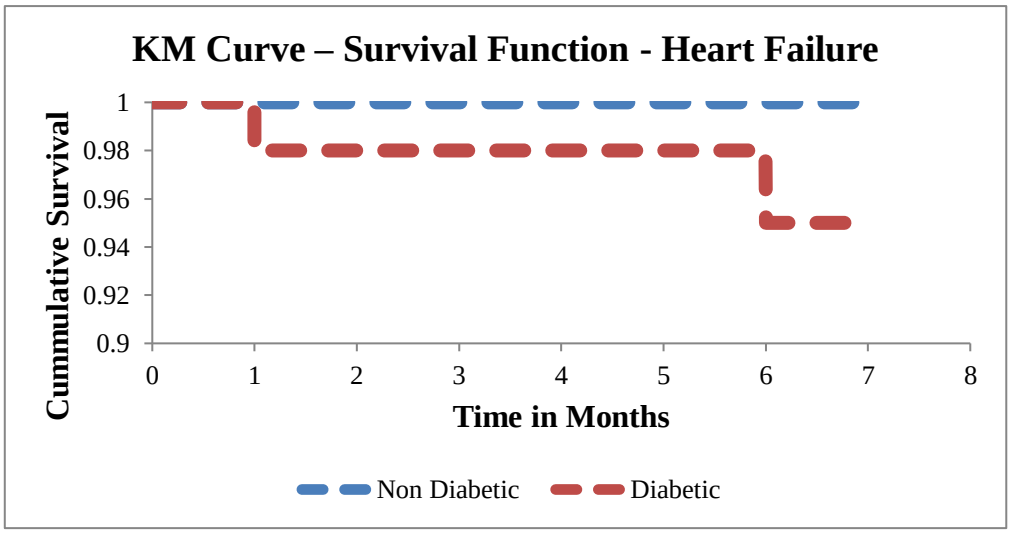

Figure 1. Kaplan Meier Curve

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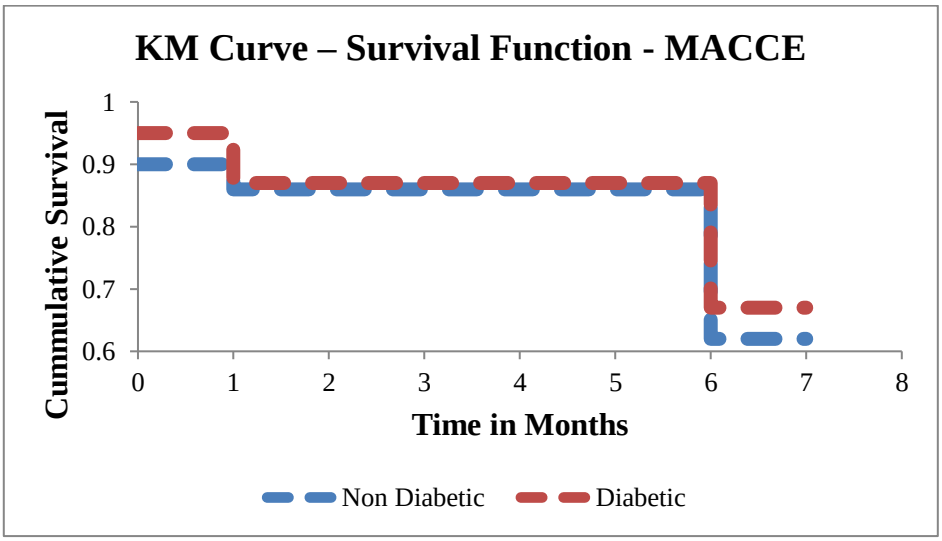
Log-rank test; z = 0.77, p = 0.21

MACCE



Log-rank test; z = 0.98, p = 0.33