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Impact of Initial Thrombocytopenia on Short and Midterm Outcomes in Patients with Acute Coronary Syndromes Who Underwent Percutaneous Coronary Intervention

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Abstract

Background: Acute Coronary Syndromes (ACS) patients with thrombocytopenia are challenging in their management as they carry high bleeding and thrombotic risks.

Aim of Study: In this study we aimed to assess the impact of thrombocytopenia on ACS patients.

Patients and Methods: We collected data of 608 ACS patients who presented to our hospital during the year 2017. Patients were divided into 2 groups according to the presence of initial thrombocytopenia: Group 1 with initial thrombocytopenia (n=123) and group 2 without initial thrombocytopenia (n=485). Platelet count less than or equal 150.000/ml was used to define thrombocytopenia. Endpoints were in-hospital and 6 months Major Adverse Cardiovascular and Cerebrovascular Events (MACCE).

Results: Group 1 patients were significantly older and, more likely with a history of acute coronary syndrome (38.2% versus 26.7%, p=0.049), and more likely to present as non ST elevation myocardial infarction (39% versus 26.7%, p=0.037). In hospital outcome showed significantly higher risk of cumulative MACCE in group 1 patients (12.2% versus 2.3%, p=0.002) and a similar result was found after at least 6 months follow-up (19.3% versus 9.6%, p=0.041). Both groups had similar incidence of bleeding and heart failure. Group 1 patients had significantly higher incidence of in hospital MACCE (p=0.038), but this was not significant after 6 months follow-up.

Conclusions: ACS patients with mild thrombocytopenia had similar bleeding risk in comparison to patients with normal count during the hospital stay and after 6 months of follow-up, higher risk of in hospital MACCE and so they should be managed as patients with normal platelet counts.

Key Words: *Acute coronary syndromes – Thrombocytopenia – Percutaneous coronary intervention.*

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Introduction

THE incidence of Acute Coronary Syndromes (ACS) either ST-Segment Elevation Myocardial Infarction (STEMI) or Non ST-Segment Elevation Myocardial Infarction (NSTEMI) is increasing globally and it become most common cause of death worldwide. According to the latest guidelines, primary Percutaneous Coronary Intervention (PCI) in STEMI or early PCI in high-risk NSTEMI patients combined with antithrombotic drugs are the treatment of choice **[1-3]**.

Diagnosis and classification of thrombocytopenia is based on the platelet count. The current classification of thrombocytopenia is mild (platelet count 100,000 to 150,000/microL), moderate (50,000 to 99,000/microL), or severe (<50,000/microL) **[4,5]**.

List of Abbreviations:

ACS	: Acute Coronary Syndromes.
PCI	: Percutaneous Coronary Intervention.
MACCE	: Major Adverse Cardiovascular and Cerebrovascular Events.
STEMI	: ST Segment Elevation Myocardial Infarction.
NSTEMI	: None ST Segment Elevation Myocardial Infarction.
EF	: Ejection Fraction.
MR	: Mitral Regurge.
DAPT	: Dual Antiplatelet therapy.
Hb	: Haemoglobin.
LM	: Left Main.
LAD	: Left Anterior Descending.
LCX	: Left Circumflex.
RCA	: Right Coronary Artery.
LR	: Low Risk.
HR	: High Risk.
IR	: Intermediate Risk.
VLR	: Very Low Risk.
VHR	: Very High Risk.
GP IIb/IIIa inhibitor	: Glycoprotein IIb/IIIa inhibitor.

There are several pathological conditions leading to thrombocytopenia such as decreased platelet production, increased platelet consumption or platelet sequestration [6-8].

The incidence of thrombocytopenia in general is approximately 13%, while the incidence in ACS patients is about 5%. Previous trials have shown that elderly, patients with diabetes, liver impairment, renal diseases, heart failure or previous cardiovascular diseases had the highest incidence [9]. The presence of baseline initial thrombocytopenia in ACS patients is a significant predictor of worse outcomes. In a study conducted by Yadav et al., they concluded that the presence of thrombocytopenia at baseline was an independent predictor of mortality at 1 year with no association with major or minor bleeding rates at 30 days [10].

The exact mechanisms beyond the correlation between thrombocytopenia and increased risk of ischemic events are still not clear. Some studies suggested that thrombocytopenia may be a marker of heavy burden of atherosclerosis predisposing to increased platelet consumption or reflecting increased thrombosis [11,12].

Recent guidelines recommend the use of Dual Antiplatelet Therapy (DAPT) in management of ACS patients. Currently there is no clear recommendation regarding the duration or type of DAPT used in this cohort of patients. ACS patients with thrombocytopenia are challenging in their management due to their high bleeding and ischeamic risks [13].

Also this group of patients have been excluded or underrepresented in major DAPT in ACS trials as TRITON-TIMI 38, PLATO, CURE and CHAMPION PHONIX trials [9,14].

In this study we aimed to assess the impact of initial thrombocytopenia on short and midterm outcomes of patients with ACS managed with PCI.

Patients and Methods

Study design:

This is a retrospective observational study conducted on consecutive ACS patients who presented to the Alexandria Main University Hospital, Alexandria, Egypt between 1 January and 31 December 2017. The inclusion criteria were established diagnosis ACS fulfilling guidelines recommendation for PCI treatment [3]. The exclusion criteria were previous CABG, cardiogenic shock, previous PCI of the same culprit vessel and severe Left Main (LM) coronary artery disease. The study population included 608 patients who were classified into two groups:

- *Group 1:* Included 123 ACS patients with initial thrombocytopenia platelet count less than 150 X 10^3/microliter treated with PCI.
- *Group 2:* Included 485 ACS patients with initial normal platelet count more than 150 X 10^3/ microliter treated with PCI.

An informed consent was obtained from every patient or the legal guardians. The study was approved by the Local Ethics Committee.

Data collection:

All patients' demographic data were collected including age, gender, comorbidities (hypertension, diabetes, prior ACS, dyslipidemia), obtained PCI procedure details including access site, the culprit artery, number of diseased vessels, the use of antithrombotic treatment (acetyl salicylic acid, clopidogrel, ticagrelor, heparin, enoxaparin, and glycoprotein IIb/IIIa inhibitors). Also, any subsequent procedure related complications e.g., heart failure, stroke, or bleeding were documented. From laboratory data, we registered haemoglobin, platelet count, creatinine and Troponin I levels on admission and peak levels during the hospital stay. From echocardiography the following information were collected; Ejection Fraction (EF) and Mitral Regurgitation (MR). Baseline CRUSADE bleeding risk score and GRACE risk score were also calculated [15,16].

Clinical endpoint measurements:

The endpoints of the study were Major Adverse Cardiac and Cerebrovascular Events (MACCE) during hospital stay and at 6 months follow-up. MACCE was defined as death, re-infarction, need for revascularization, heart failure, stroke, and bleeding.

Statistical analysis:

Data were analyzed using the Statistical Package for Social Sciences (SPSS version 20.0. Armonk, NY: IBM Corp) [17]. We described qualitative data using number and percent and we described quantitative data using range (minimum and maximum), mean, standard deviation and median. Significance of the obtained results was judged at the 5% level. The used tests were Chi-square test for categorical variables to compare between different groups, Fisher's Exact or Monte Carlo correction for chi-square when more than 20% of the cells have expected count less than 5, student *t*-test for normally distributed quantitative variables, to compare between two studied groups, Mann Whitney test

for abnormally distributed quantitative variables, to compare between two studied groups and regression to detect the most independent/affecting factor for MACCE.

Results

Patients characteristics: Both patient groups (1 and 2) were well matched with respect to demographic data and clinical characteristics except for the age, history of previous ACS, and diagnosis of NSTEMI at presentation which were significantly higher in group 1. The baseline characteristics of both groups are presented in (Table 1).

Table (1): Baseline characteristics of the studied populations.

	Group 1 (n=123)		Group 2 (n=485)		Test of significance	*p*
	No.	%	No.	%		
Gender:						
Male	97	78.8	374	77.1	χ^2=0.115	0.735
Female	26	21.2	111	22.9		
Age, years:						
Mean ± SD	62.1±10.41		57.13±9.80		*t*=3.918*	<0.001*
Diabetes	59	48.0	215	44.3	χ^2=0.348	0.555
Hypertension	80	65.0	292	60.2	χ^2=0.608	0.436
Dyslipidemia	18	14.6	74	15.3	χ^2=0.020	0.888
History of ACS	47	38.2	129	26.6	χ^2=3.834*	0.049*
Smoking	80	65.0	307	63.3	χ^2=0.078	0.780
STEMI	76	61.8	355	73.2	χ^2=1.908	0.167
NSTEMI	47	38.2	130	26.8	χ^2=4.367*	0.037*

χ^2 : Chi square test.
t : Student *t*-test.
p : *p*-value for comparing between the two groups.
* : Statistically significant at $p \leq 0.05$.

Table (2): Laboratory and echo cardiographic data of the studied population.

ECHO & LAB	Group 1 (n=123)		Group 2 (n=485)		Test of sig.	*p*
	No.	%	No.	%		
MR	50	40.7	129	26.7	χ^2=5.531	0.019*
EF %:						
Mean ± SD	52.35±13.88		55.93±12.46		*t*=2.166*	0.031*
Hb:						
Mean ± SD	12.66±2.02		13.23±1.58		*t*=2.501*	0.013*
Creatinine:						
Mean ± SD	1.27±0.80		1.02±0.61		U=6325.50*	0.003*
Platelets:						
Min.-max.	49.0-150.0		175.10-515.0		U=0.00*	<0.001*
Mean ± SD	136.84±18.68		263.71±59.07			
Median	145.0		259.0			

χ^2 : Chi square test.
t : Student *t*-test.
U : Mann Whitney test.
p : *p*-value for comparing between the two groups.
* : Statistically significant at $p \leq 0.05$.
MR : Mitral Regurge.
Hb : Haemoglobin.
EF : Ejection Fraction.

Echocardiography and laboratory results: Thrombocytopenic patients had significantly higher incidence of MR and lower EF. The prevalence of anemia was significantly higher in group 1 than in group 2 (12.66±2.02 vs. 13.23±1.58, p=0.013), serum creatinine levels were also higher in group 1 than in group 2. The incidence of thrombocytopenia in our study was 20.2%, 117 patients had mild thrombocytopenia, five patients had moderate thrombocytopenia and one patient had severe thrombocytopenia. The baseline echocardiography and laboratory results of both groups are presented in (Table 2).

Crusade bleeding risk score and Grace risk score **[15,16]**: Patients in group 1 had signicantly higher Crusade bleeding and Grace risk scores than patients in group 2 as shown in (Table 3).

Table (3): Crusade bleeding and Grace risk scores of the studied population.

	Group 1 (n=123)		Group 2 (n=485)		Test of sig.	*p*
	No.	%	No.	%		
• **Crusade:**						
Risk:						
VLR	17	13.8	196	40.50	χ^2=	<0.001*
VHR	25	20.3	37	7.6	33.378	
LR	33	26.8	159	32.8		
MR	25	20.3	52	10.7		
HR	23	18.7	41	8.4		
Score:						
Min.-max.	7.0-76.0		8.0-76.0		U=	<0.001*
Mean ± SD.	35.72±15.95		26.08±14.06		5027.50*	
Median	36.0		23.0			
• **Grace:**						
Risk:						
LR	42	34.1	247	51.1	χ^2=	0.007*
HR	29	23.6	56	11.5	10.036	
IR	52	42.3	182	37.4		
Score:						
Min.-max.	50.0-182.0		33.0-177.0		*t*=	<0.001*
Mean ± SD	101.47±23.89		89.37±26.63		3.802*	
Median	102.0		89.0			
In hospital mortality:						
Min.-max.	0.20-26.10		0.10-32.50		U=	0.005*
Mean ± SD	2.54±3.22		2.29±4.07		6401.0*	
Median	1.70		1.10			
Death from admission-6 months:						
Min.-max.	0.70-40.0		0.40-40.0		U=	<0.001*
Mean ± SD	5.48±5.55		4.26±5.79		5918.50*	
Median	4.0		3.0			
After 1 year:						
Min.-max.	0.80-60.10		0.50-63.0		U=	<0.001*
Mean ± SD	7.79±7.84		5.42±8.04		4996.50*	
Median	5.50		3.0			

LR : Low Risk.
VLR : Very Low Risk.
MR : Moderate Risk.
HR : High Risk.
VHR : Very High Risk.
IR : Intermediate Risk.
χ^2 : Chi square test.
U : Mann Whitney test.
t : Student *t*-test.
p : *p*-value for comparing between the two groups.
* : Statistically significant at $p \leq 0.05$.

Procedural characteristics of the studied population: With regard to the PCI data, the prevalence of multivessel disease was not different between the two groups, as was the culprit artery and the access site either femoral or radial. Also, the antiplatelet treatment with clopidogrel, ticagrelor or GP IIb/IIIa inhibitors did not differ. None of the patients in the two groups received fibrinolytic therapy. All patients in the two groups received Drug Eluting Stents (DES) and no patient had procedure related dissection or perforation. All patients received in-hospital medical treatment and follow-up according to the latest ACS guidelines [3]. Data of the procedural characteristics of the studied population are summarized in (Table 4).

Table (4): Procedural characteristics of the studied population.

PCI details	Group 1 (n=123)		Group 2 (n=485)		*p*
	No.	%	No.	%	
Access site:					
Radial	12	9.8	33	6.8	0.404
Femoral	111	90.2	452	93.2	
LM	7	5.7	111	2.3	0.205
LAD	78	63.4	285	58.8	0.449
RCA	54	43.9	177	36.6	0.238
LCx	50	40.7	229	47.3	0.284
Ramus	5	4.1	4	0.8	0.110
Antiplatelets:					
Clopidogrel	75	60.9	278	57.3	0.410
Ticagrelor	48	39.1	207	42.7	0.425
GP IIb/IIIa inhibitor	2	1.6	16	3.3	0.345

p : *p*-value for comparing between the two groups.
Statistically significant at $p \leq 0.05$.
LM : Left Main. RCA : Right Coronary Artery.
LAD : Left Anterior Descending. LCX : Left Circumflex.

In hospital outcomes:

In hospital cumulative MACCE was higher in group 1 (12.2% vs. 2.3%) compared to group 2, the difference between the two was significant (p =0.002). Five patients in group 1 and seven patients in group 2 died, mostly because of arrhythmia (ventricular fibrillation) and the rest developed intractable cardiogenic shock and pulmonary edema. The need for revascularization, incidence of heart failure, reinfarction or bleeding was not different between groups. Although there was statistically high ischemic stroke prevalence in group 1, we are unable to ascertain an exact explanation for it. One possible practice-based explanation for this finding is that in group 1 we used more thrombus aspiration catheters during PCI than in group 2. Hemorrhagic stroke or major bleeding did not occur in any patient of the 2 groups. The data of in-hospital outcomes are summarized in (Table 5).

Table (5): In hospital outcomes of the studied population.

Hospital outcomes	Group 1 (n=123)		Group 2 (n=485)		χ^2	*p*
	No.	%	No.	%		
MACCE	15	12.2	11	2.3	9.452*	0.002*
Death	5	4.1	7	1.5	1.525	FE_p=0.269
Revascularization:						
Non TVR	2	1.6	0	0.0	2.147	FE_p=0.234
TVR	2	1.6	4	0.8	0.404	FE_p=0.612
MI	4	3.3	4	0.8	2.036	FE_p=0.201
CVS:						
Ischemic	5	4.1	0	0.0	5.432*	FE_p=0.026*
Hemorrhagic	0	0.0	0	0.0		
HF	30	24.4	74	15.3	3.340	0.068

χ^2 : Chi square test.
FE_p : Fisher Exact.
MACCE : Major Adverse Cardiovascular and Cerebrovascular Events.
TVR : Target Vessel Revascularization.
MI : Myocardial Infarction.
CVS : Cerebrovascular Stroke.
HF : Heart Failure.
p : *p*-value for comparing between the two groups.
* : Statistically significant at $p \leq 0.05$.

6 months follow-up: Fourteen patients from group 1 and seventeen patients from group 2 were lost during follow-up. The composite MACCE was higher in group 1 (19.3 vs. 9.6%, p=0.041) as was the incidence of cardiac death (6.4 vs. 0.9%) compared to group 2, the difference between the two was significant (p=0.032). The need for revascularization, re-infarction, the incidence of heart failure, bleeding or stroke was not different between groups. The data of 6 months follow-up outcomes are summarized in (Table 6).

Table (6): 6 months follow-up outcomes of the studied population.

	Group 1 (n=109)		Group 2 (n=468)		χ^2	*p*
	No.	%	No.	%		
MACCE	21	19.3	45	9.6	4.193*	0.041*
Death	7	6.4	4	0.9	4.953*	FE_p=0.032*
Revascularization:						
Non TVR	6	5.5	8	1.8	2.266	FE_p=0.164
TVR	6	5.5	25	5.3	0.006	0.936
MI	12	11.0	33	7.0	1.087	0.297
CVS:						
Ischemic	2	1.8	8	1.8	0.002	FE_p=1.000
Hemorrhagic	0	0.0	0	0.0		
HF	26	23.9	74	15.8	.288	0.130

χ^2 : Chi square test.
FE_p : Fisher Exact.
MACCE : Major Adverse Cardiovascular and Cerebrovascular Events.
TVR : Target Vessel Revascularization.
MI : Myocardial Infarction.
CVS : Cerebrovascular Stroke.
HF : Heart Failure.
p : *p*-value for comparing between the two groups.
* : Statistically significant at $p \leq 0.05$.

Relationship between initial thrombocytopenia and MACCE: Multivariable regression modeling showed that mild thrombocytopenia contributed to higher incidence of in hospital MACCE (p= 0.038). However, it did not show any significant correlation with MACCE after 6 months followup. Tables (7,8) summarize multivariable regression modeling in hospital and after 6 months follow-up.

Table (7): Univariate and multivariate analysis for the parameters affecting in hospital MACCE (n=608) for total sample.

MACCE (Hospital outcomes)	Univariate		#Multivariate	
	p	OR (95% C.I)	p	OR (95% C.I)
Females	0.082	2.429 (0.895-6.591)		
Age (years)	0.201	1.030 (0.984-1.078)		
Past history:				
Diabetes	0.886	0.932 (0.355-2.455)		
Hypertension	0.892	0.934 (0.349-2.499)		
Dyslipidemia	0.271	0.316 (0.041-2.450)		
ACS	0.035*	2.874* (1.079-7.51)	0.588	1.457 (0.413-5.137)
Smoking	0.779	0.868 (0.325-2.324)		
STEMI	0.600	0.736 (0.234-2.317)		
Non STEMI	0.951	1.032 (0.373-2.855)		
EF %	0.001 *	0.942*(0.910-0.976)	0.144	0.962 (0.913-1.013)
Hb	0.005*	0.679*(0.517-0.892)	0.060	4.301 (0.940-19.678)
Platelets	0.005*	0.985* (0.975-0.995)	**0.038***	0.988 (0.977-0.99)
Creatinine	0.012*	1.702* (1.123-2.579)	0.196	1.425 (0.833-2.436)
Troponin	0.339	1.012 (0.987-1.037)		
Score (Crusade)	0.001 *	1.052* (1.021-1.083)	0.676	0.988 (0.934-1.045)
Score (Grace)	0.023 *	1.021* (1.003-1.039)	0.807	1.005 (0.965-1.047)
In hospital mortality	0.108	1.072 (0.985-1.167)		
6 Months mortality	0.060	1.056 (0.998-1.119)	0.770	0.986 (0.898-1.083)
Antiplatelets:				
Clopidogrel	0.952	0.965 (0.304-3.058)		
Ticagrelor	0.708	0.783 (0.218-2.816)		
GP IIbIIIa inhibitors	0.028*	7.250* (1.233-42.6)	0.192	5.874 (0.411-83.990)
PCI details				
Access site:				
Radial	0.667	0.635 (0.080-5.025)		
Femoral	0.667	0.635 (0.080-5.025)		
LM	0.001 *	10.952*(2.768-43.33)	0.078	4.913 (0.836-28.861)
LAD	0.317	1.721 (0.594-4.987)		
RCA	0.380	1.53 (0.589-4.016)		
LCx	0.314	1.64 (0.626-4.309)		
Ramus	0.999	–		
Death	0.999	–		
Non TVR	0.999	–		
TVR	0.999	–		
MI	0.999	–		
Ischemic	0.999	–		
Hemorrhagic	0.999	–		

OR : Odd´s ratio.
C.I : Confidence Interval.
: All variables with p<0.05 was included in the multivariate.
* : Statistically significant at p≤0.05.
ACS : Acute Coronary Syndromes.
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Hb : Haemoglobin.
LM : Left Main.
LAD : Left Anterior Descending.
LCX : Left Circumflex.
RCA : Right Coronary Artery.
GP IIb/IIIa inhibitor : Glycoprotein IIb/IIIa inhibitor.

Table (8): Univariate and multivariate analysis for the parameters affecting 6 months at least follow-up MACCE (n=577) for total sample.

MACCE (Follow-up)	Univariate		#Multivariate	
	p	OR (95% C.I)	*p*	OR (95% C.I)
Females	0.155	0.450 (0.150-1.351)		
Age (years)	0.055	1.036 (0.99-1.075)		
Past history:				
Diabetes	0.338	1.444 (0.681-3.059)		
Hypertension	0.562	1.262 (0.576-2.766)		
Dyslipidemia	0.698	1.230 (0.433-3.489)		
ACS	0.002*	3.262* (1.516-7.018)	0.116	3.117 (0.756-12.846)
Smoking	0.938	1.032 (0.469-2.268)		
STEMI	0.265	0.585 (0.228-1.502)		
Non STEMI	0.155	1.740 (0.811-3.732)		
EF %	0.257	0.983 (0.955-1.012)		
Hb	0.233	0.881 (0.715-1.085)		
Platelet count	0.104	0.995 (0.990-1.001)		
Troponin	0.321	1.010 (0.990-1.031)		
Score (Crusade)	0.042*	1.024* (1.001-1.047)	0.298	0.983 (0.951-1.016)
Score (Grace)	0.029*	1.016* (1.002-1.030)	0.770	0.995 (0.965-1.026)
In hospital mortality	0.143	1.060 (0.981-1.145)		
6 Months mortality	0.020*	1.061* (1.009-1.115)	0.226	1.076 (0.956-1.212)
Antiplatelets:				
Clopidogrel	0.155	2.221 (0.740-6.664)		
Ticagrelor	0.227	0.507 (0.168-1.526)		
GP IIbIIIa inhibitors	0.201	3.117 (0.547-17.767)		
PCI details				
Access site:				
Radial	0.263	0.310 (0.040-2.407)		
Femoral	0.263	3.225 (0.415-25.046)		
LM	0.010*	6.679* (1.580-28.236)	0.047*	5.213* (1.020-26.630)
LAD	0.060	2.257 (0.965-5.280)		
RCA	0.386	1.395 (0.657-2.962)		
LCx	0.285	1.507 (0.711-3.193)		
Ramus	0.999	–		
Death	0.999	–		
Non TVR	1.000	–		
TVR	0.999			
MI	0.999			
Ischemic	0.999			
Hemorrhagic	0.999	–		

OR : Odd´s ratio.
C.I : Confidence Interval.
: All variables with $p<0.05$ was included in the multivariate.
* : Statistically significant at $p\leq0.05$.
ACS : Acute Coronary Syndromes.
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LM : Left Main.
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LCX : Left Circumflex.
RCA : Right Coronary Artery.
GP IIb/IIIa inhibitor : Glycoprotein IIb/IIIa inhibitor.

Discussion

Baseline initial thrombocytopenia defined as platelet count less than or equal 150,000/ml is not an uncommon finding among patients presenting with ACS and previous trials showed its correlation with worse outcome **[10,18,19]**. The objective of this study was to evaluate the impact of initial thrombocytopenia on the outcomes of ACS patients treated with PCI either in-hospital or after 6 months follows-up. Our results show that the incidence of thrombocytopenia in ACS patients is approximately 20.2%. This finding is comparable to the results of Sinkovič A et al., who reported 21.3% incidence of thrombocytopenia among ACS patients **[22]**. Other studies conducted by McClure et al., **[11]**, Yeh et al., **[20]** Eikelboom JW **[21]**, and Yadav et al., **[10]** reported lower incidence ranging from 1-7%. In our study thrombocytopenic patients were significantly older, with history of previous ACS, and more likely to present as NSTEMI. These results are consistent with previous studies. Yadav et al., showed that baseline thrombocytopenia was more common in older men with diabetes mellitus, anemia, previous MI, and renal insufficiency and was associated with higher rates of long-term adverse ischemic events after PCI **[10]**.

Our findings can be summarized in showing significant increase in cumulative MACCE while in-hospital and after 6 months follow in thrombocytopenic patients. This finding is compatible with other studies. Yadav et al., and Sinkovic A et al., **[10,22]** also reported higher incidence of in hospital mortality in thrombocytopenic patients. Despite that, the prevalence of developed heart failure, re-infarction need for revsacular iztion and bleeding was not different from non thrombocytopenic patients.

Univariate and multivariate logistic regression analyses were performed to identify the factors associated with MACCE either during hospitalization or after six months follow-up. This showed that baseline thrombocytopenia was an independent predictor of in-hospital MACCE (p=0.038), but this was not the same after six months follow-up. These findings were similar to results reported by Yadavetal and Sinkovic A et al., **[10,22]** that showed association between thrombocytopenia and adverse outcomes.

Major bleeding did not occur in any patient of the two groups neither in hospital or after 6 months follow-up due to the fact that most of our patients had only mild thrombocytopenia only 6 patients had platelet counts below 100,000/ml.

Limitations:

This study has some obvious limitations. First most of the patients had mild thrombocytopenia, which may have affected the results. Second this was a single center trial including relatively small number of patients. We still need more trials including larger number of patients and including ACS patients with moderate or severe thrombocytopenia.

Conclusion:

Our study shows that ACS patients with mild thrombocytopenia had significantly higher MAACE in comparison to non thrombocytopenic patients either in-hospital or after 6 months of follow-up, but similar bleeding risk and so they should be managed as patients with normal platelet counts.

Author contributions:

Conceptualization, S.A., M.S., and O.N.; Methodology, S.A., M.S., and M.S.; Software, R.S.; Validation, S.A.; Formal analysis, S.A., M.S., and O.N.; Investigation, S.A., M.S., and M.S.; Writing-original draft preparation, S.A.; Writing-review and editing, S.A., M.S., and O.N. All authors have read and agreed to the published version of the manuscript.

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تأثير نقص الصفائح الدموية الأولى على النتائج قصيرة ومتوسطة الأمد فى مرضى متلازمة قصور الشرايين التاجية الحادة الذين يتم علاجهم عن طريق القسطرة التداخلية

الغرض من البحث: تقييم تأثير نقص الصفائح الدموية الأولى على النتائج قصيرة ومتوسطة الأمد فى مرضى متلازمة قصور الشرايين التاجية الذين يتم علاجهم عن طريق القسطرة التداخلية.

طرق البحث: بأثر رجعى وإشتمل على ٦٠٨ مريض ممن أتموا علاجهم بالمستشفى الرئيسى الجامعى بالإسكندرية. خضع كل المرضى المشاركون فى البحث للتالى: إستقصاء مفصل للتاريخ المرضى، فحص إكلينيكى شامل، تحاليل الدم الروتينية، تخطيط القلب الكهربائى، إضافة إلى كل المعطيات للقسطرة التشخيصية والتداخلية للشرايين التاجية. كما تم تسجيل المضاعفات المصاحبة للقسطرة إضافة للمضاعفات المتأخرة. وتم تسجيل كافة البيانات المستخدمة فى البحث فى الفترة ما بين الأول من يناير ٢٠١٧ وحتى نهاية شهر ديسمبر ٢٠١٧. تم تقسيم المرضى لمجموعتين: المجموعة الأولى: نقص الصفائح الدموية الأولى وهم ١٢٣ مريضاً. والمجموعة الثانية: بدون نقص الصفائح الدموية الأولى هم ٤٨٥ مريضاً.

النتائج: كان مرضى المجموعة الأولى أكبر سناً بشكل ملحوظ، والأرجح أن لديهم تاريخ من متلازمة الشريان التاجى الحادة (٣٨.٢٪ مقابل ٢٦.٧٪ = ٠.٠٤٩)، وأكثر إحتمالية لتقديم إحتشاء عضلة القلب غير المرتفع (٣٩٪ مقابل ٢٦.٧٪ ع = ٠.٠٣٧). أظهرت نتائج المستشفى إختطاراً أعلى بشكل ملحوظ للمضاعفات التراكمى فى مرضى المجموعة ١ (١٢.٢٪ مقابل ٢.٣٪، p=0.002) وتم العثور على نتيجة مماثلة بعد ٦ أشهر على الأقل من المتابعة (١٩.٣٪ مقابل ٩.٦٪، ٠.٠٠٤١). كان لدى كلتا المجموعتين حالات مماثلة من النزيف وفشل القلب. كان لدى مرضى المجموعة ١ نسبة أعلى بشكل ملحوظ فى المضاعفات فى المستشفى، ولكن هذا لم يكن مهماً بعد ٦ أشهر من المتابعة.

الخلاصة: إن المرضى الذين يعانون من قلة الصفيحات الخفيفة لديهم مخاطر نزيف مماثلة مقارنة بالمرضى الذين لديهم عدد طبيعى أثناء الإقامة فى المستشفى وبعد ٦ أشهر من المتابعة، يكون لديهم خطر أكبر لحدوث المضاعفات فى المستشفى وبالتالى يجب تدبيرهم كمرضى لديهم تعداد طبيعى للصفائح الدموية. ما زلنا بحاجة إلى مزيد من التجارب بما فى ذلك عدد أكبر من المرضى بما فى ذلك المرضى الذين يعانون من قلة الصفيحات المعتدلة أو الشديدة.