

Research Article

Value of Mean platelet volume in predicting Impaired Reperfusion and six month Mortality in Acute ST Elevation Myocardial Infarction treated with Primary Percutaneous Coronary Intervention using Drug-Eluting Stent

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Abstracts

Myocardial infarction is a common presentation of coronary artery disease. **Aim of the work:** The aim of the study is to detect the predictive value of Mean Platelet Volume (MPV) for the result and outcome of Angiographic. **Patients and Methods:** The study enrolled 130 consecutive patients, admitted with acute STEMI at Agouza Police Hospital, at period from January 2015 to October 2016, who were treated by primary PCI within maximum 6 hours from onset of symptoms (chest pain). **Results:** Our study enrolled 130 cases who suffered Acute STEMI. and treated by primary PCI, the study included 112 male and 18 females, Average age was 52(± 9) years old, Regarding risk factors of coronary artery diseases; 70 cases were known to be Diabetic, 115 cases were smokers, 55 cases were known to be Hypertensive, and 78 cases were Dyslipidemic. **Discussion:** It is known that Larger platelets are metabolically and enzymatically more active than smaller platelets, containing more prothrombotic material, with increased thromboxane A₂ and B₂ per unit volume and glycoprotein IIb–IIIa receptor expression.

KeyWords: Bare metal stent, Coronary artery disease, Dual anti platelet therapy

Introduction

Myocardial infarction is a common presentation of coronary artery disease. The World Health Organization estimated, that 12.2% of worldwide deaths were from ischemic heart disease; being the leading cause of death in high- or middle-income countries and second only to lower respiratory infections in lower-income countries. Worldwide, more than 3 million people have ST elevation MI (STEMI) and 4 million have non-ST elevation MI (NSTEMI) a year. STEMI occur about twice as often in men as women. (World Health Organization 2010)

Aim of the work

The aim of the study is to detect the predictive value of Mean Platelet Volume (MPV) for the result and outcome of Angiographic reperfusion impairment and six months' mortality in patients with acute ST-segment Elevation Myocardial Infarction (STEMI) treated with Primary Percutaneous

Coronary Intervention (PPCI) and using Drug Eluting Stent (DES) for coronary artery lesions.

Patients and Methods

A) Patients

*The study enrolled 130 consecutive patients, admitted with acute STEMI at Agouza Police Hospital, at period from January 2015 to October 2016, who were treated by primary PCI within maximum 6 hours from onset of symptoms (chest pain)".

Inclusion Criteria:

Acute STEMI was defined by the following criteria;

typical chest pain lasting for more than 30 minutes.

ECG changes consistent with STEMI in form of: New ST elevation at the J point in two contiguous leads of >0.1 mV in all leads other than leads V2-V3.

For leads V2-V3 the following cut points apply: ≥ 0.2 mV in men ≥ 40 years, ≥ 0.25 mV in men < 40 years, or ≥ 0.15 mV in women new or presumed new LBBB (2017 ACCF/AHA guideline) (Ibanez et al.;2017)

Exclusion Criteria

Significant Multi Vessels Disease with Multiple lesions, and Coronary lesions that requires urgent surgical intervention (CABG) like Lesions in Left Main Coronary Artery or Left Main Equivilant lesions.

Diseases causing abnormally High Mean Platelet Volume and Platelet indices :

Patient with long standing Renal Failure. Diagnosed Chronic Autoimmune and Collagen Disease like Rheumatoid Arthritis and SLE. Anemia with hemoglobin less than 10 gm% (Gasparyan et al.; 2011)

Results

Our study enrolled 130 cases who suffered Acute STEMI. and treated by primary PCI, the study included 112 male and 18 females, Average age was 52(\pm 9)tears old, Regarding risk factors of coronary artery diseases; 70 cases were known to be Diabetic, 115 cases were smokers, 55 cases were known to be Hypertensive, and 78 cases were Dyslipidemic. (Table 1).

Table (1): Demographic data and risk factors for the study population

Sex	112 males	86%	18 females	14%
DM	70 (+ve)	54%	60 (-ve)	46%
HTN	55 (+ve)	42%	75 (-ve)	58%
Smoker	115 (+ve)	88.5%	15 (-ve)	11.5%
Dyslipidemia	78 (+ve)	60%	52 (-ve)	40%
Family History of IHD	42 (+ve)	32%	88 (-ve)	68%

DM=Diabetes Mellitus, HTN=Hypertension, IHD=Ischemic Heart Disease

The outcome of the 6-month follow up to the cases declared 23 cases showed MACE in form of 2 cases of ischemic cardiomyopathy that required hospitalization , 8 cases of ischemia induced moderate to severe Mitral regurge, 12 cases of restenosis and reinfarcion, and one Mortality case, the percentage of MACE was 17.7% of all study population..

Discussion

It is known that Larger platelets are metabolically and enzymatically more active than smaller platelets, containing more prothrombotic material, with increased thromboxane A2 and B2 per unit volume and glycoprotein IIb-IIIa receptor expression. They show greater aggregability in response to ADP and decreased inhibition of aggregation by prostacyclin in vitro. Larger platelets are denser and contain more α -granules, which can release prothrombotic substances, including platelet factor 4, P-selectin, and platelet-derived growth factor; a chemotactic and mitogenic factor contributing to vascular neointimal proliferation. (Jakubowski, et al., 2004)

The workshop of our study is to detect the predictive value of Mean Platelet Volume (MPV) on the outcome of Angiographic profile of the culprit vessel and its relation to the six months incidence of (MACE), in patients with acute (STEMI) treated with (Primary PCI) using Drug Eluting Stent (DES) for coronary artery lesions.

Recommendations

Based on our results we could recommend that: Taking serum MPV on admission of cases of STEMI as a predictive value of incidence of impaired reperfusion and 6 months incidence of Major Adverse Cardiac Events after treatment of Primary PCI.

Cases with MPV more than 10.8 fL are more susceptible of impaired reperfusion. Cases with MPV more than 11.6 fL are considered higher risky cases and more susceptible to have Major Adverse Cardiac Events.

Further studies with larger number of patients to confirm the relation between (MPV) on admission with Impaired Reperfusion (TIMI Score), Also the relation between Mean Platelet Volume (MPV) on admission with incidence of 6-month (MACE)

Further studies with larger number of patients to confirm the Cut-off values of MPV that detects higher risk patients susceptible to impaired reperfusion and MACE.

References

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