Mean Platelet Volume (MPV) as a Predictor of Infarct Related Artery Patency in Patients with ST-segment Elevation Myocardial Infarction Receiving Thrombolytic Therapy

Thesis

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متوسط حجم الصفائح الدموية **(MPV)** باعتباره أحد وسائل التنبؤ بمعدل سريان الدم في الشرايين التاجية بين المرضى الذين يعانون من احتشاء بعضلة القلب مصحوب بارتفاع جزء **ST**

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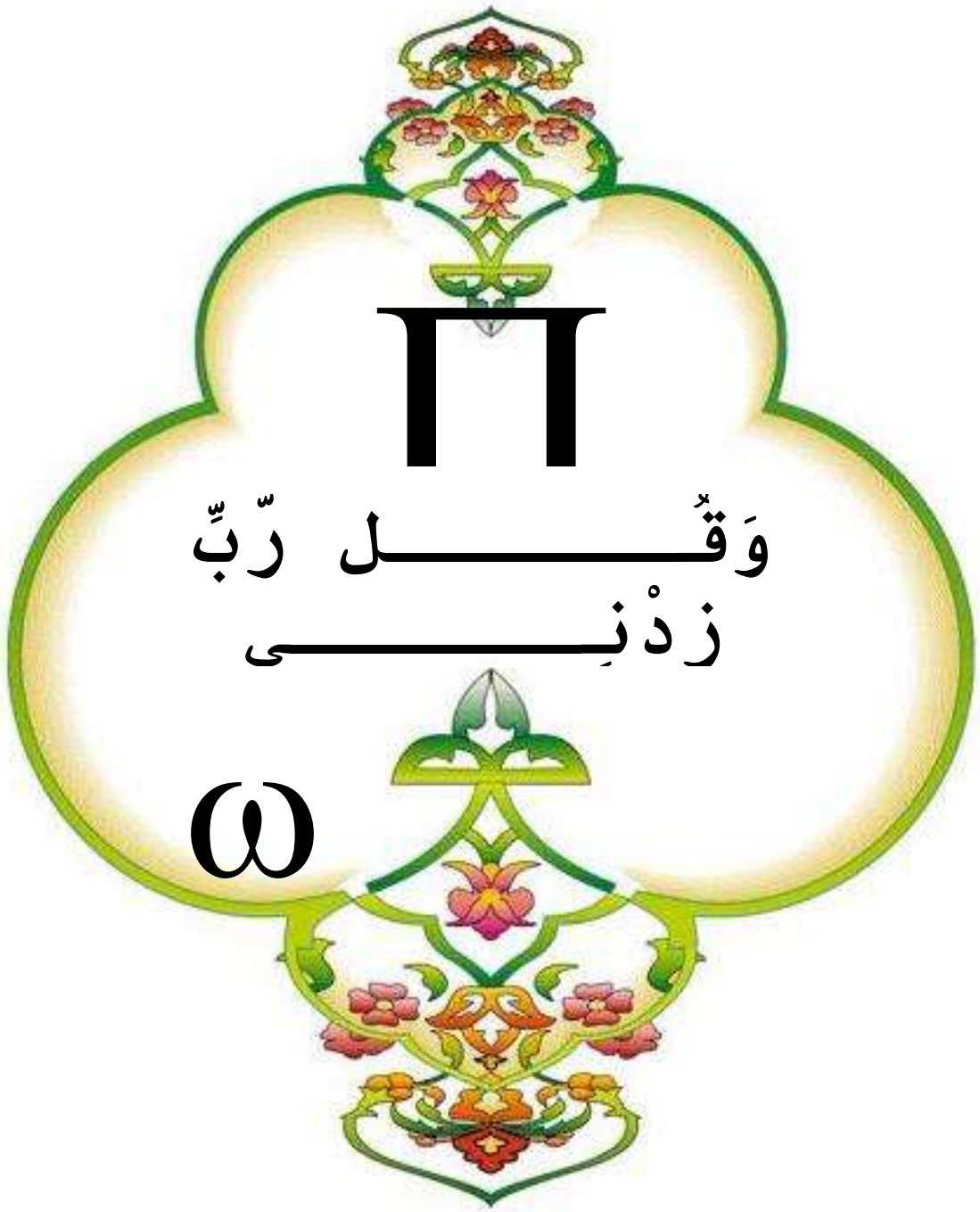

سورة طه (١١٤)

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LIST OF ABBREVIATIONS

ACEI	Angiotensin converting enzyme inhibitors
ADP	Adenosine diphosphate
AMI	Acute myocardial infarction
BBB	bundle branch block
CABG	Coronary artery bypass grafting
CBC	complete blood count
CK	Creatine kinase
D٥W	Dextrose ٥٪ in water
DBP	diastolic blood pressure
DM	diabetes mellitus
DMS	Demarcation membrane system
ECG	Electrocardiogram
ED	Emergency department
EDTA	Ethylenediaminetetraacetic acid
EMS	Emergency medical services
FL	Femtoliter
HTN	Hypertension
LBBB	Left bundle branch block
LD	Lactate dehydrogenase
LDL	Low density lipoprotein
EMS	Emergency medical system
MI	Myocardial infarction
MPV	Mean platelet volume
mRNA	messenger RNA
MINAP	Myocardial Infarction National Audit Programme
n-PA	Lanoteplase

NPV	Negative predictive value
NSTEMI	Non ST-segment elevation myocardial infarction
PCI	Percutaneous coronary intervention
PPV	Positive predictive value
PTCA	Percutaneous transluminal coronary angioplasty
r-PA	Reteplase
RBBB	right bundle branch block
SAP	stable angina pectoris
SCF	slow coronary flow
SD	standard deviation
SK	Streptokinase
STEMI	ST-segment elevation myocardial infarction
TIMI	Thrombolysis in myocardial infarction
TAFI	Thrombin-activatable fibrinolysis inhibitor
TNK	Tenecteplase
tPA	Tissue plasminogen activator
TPO	Thrombopoietin
TXA۲	Thromboxane A۲
UFH	Unfractionated heparin
UK	Urokinase
USAP	Unstable angina pectoris
URL	Upper reference limit

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INTRODUCTION

Despite impressive strides in diagnosis and management over the past decade, acute MI continues to be a major public health problem in the developing countries as well as in the developed world. In the United States more than ١ million people each year suffer an acute MI. Two hundred to three hundred thousands are estimated to die of acute MI before hospitalization. An American has an acute MI every ٢٩ seconds and someone dies of an acute MI every minute ***(Chockalingam et al,*** ***).***

The modern reperfusion era of coronary care was introduced by intracoronary and then intravenous thrombolysis, increased use of aspirin, and development of primary percutaneous transluminal coronary angioplasty (PTCA), and implantation of coronary stent for MI. These reperfusion strategies contributed to a significant decline in mortality from AMI ***(Chockalingam et al,*** ***).***

Efforts made within the last decade for finding the most efficacious fibrinolytic regimen in the ST-segment elevation acute myocardial infarction (STEMI) have resulted in the testing of more rapid regimens of alteplase (also known as tissue plasminogen activator or tPA) and of a new generation of tPA derivatives (reteplase, lanoteplase and tenecteplase) in combination with unfractionated heparin (UFH), enoxaparin, hirulog or abciximab ***(Ross A.M, et al,*** ***).***

However, although a significant increase in the Thrombolysis in Myocardial Ischemia (TIMI) grade ٣ of coronary reperfusion was reported with the new regimens, this apparent benefit did not lead to a significant reduction in mortality. Except for the GUSTO-I trial, none of the trials comparing two or more thrombolytic regimens demonstrated the superiority of any regimen in reducing mortality ***(Simoons M, et al,).***

AIM OF THE WORK

This study was addressed to investigate the correlation between mean platelet volume (MPV) and infarct related artery patency in patient with ST-segment elevation myocardial infarction receiving thrombolytic therapy.

CHAPTER (١)
MYOCARDIAL INFARCTION

Epidemiology:

Coronary heart disease in the leading cause of death Worldwide, with myocardial infarction a common manifestation of this disease. The estimated annual incidence of MI in the United States (including both STEMI and NSTEMI) is ٦٠٠ ٠٠٠ new and ٣٢٠ ٠٠٠ recurrent attacks. In ٢٠٠٤, AMI resulted in ٦٩٥٠٠٠ hospital stays and $٣١ billion in hospital charges ***(Russo and Andrews, ٢٠٠٦)***.

The risk of further cardiovascular complications, including recurrent MI, sudden cardiac death, heart failure, stroke and angina pectoris, for those who survive acute myocardial infarction(AMI) is substantial ***(Rosamond et al., .)***.

Definition:

The term myocardial infarction should be used when there is evidence of myocardial necrosis in a clinical setting consistent with myocardial ischemia. Under these conditions anyone of the following criteria meets the diagnosis of myocardial infarction:

- Detection of rise and/or fall of cardiac biomarkers (preferably troponin) with at least one value above the ٩٩th percentile of the upper reference limit (URL) together with

evidence of myocardial ischemia with at least one of the following:

- Symptoms of ischemia;
- ECG changes indicative of new ischemia (new ST-T changes or new left bundle branch block (LBBB);
- Development of pathological Q waves on the ECG;
- Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality.

- Sudden, unexpected cardiac death, involving cardiac arrest, often with symptoms suggestive of myocardial ischemia, and accompanied by presumably new ST elevation, or new LBBB, and/or evidence of fresh thrombus by coronary angiography and/or at autopsy, but death occurring before blood samples could be obtained, or at a time before the appearance of cardiac biomarkers in the blood.
- For percutaneous coronary intervention (PCI) in patients with normal baseline troponin values, elevations of cardiac biomarkers above the ٩٩th percentile URL are indicative of peri-procedural myocardial necrosis. By convention, increases of biomarkers ٣ times greater than ٩٩th percentile URL have been designated as defining PCI-related myocardial infarction. A subtype related to a documented stent thrombosis is recognized.