

Significance of Platelet Volume Indices in Patients with Coronary Artery Diseases

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Abstract

Background: Platelets play an important role in the development of intravascular thrombosis, the major cause of acute coronary syndromes. Platelet size has been considered to reflect platelet activity.

Objectives: The aim of this study is to investigate the clinical value of platelet volume indices (PVI) in the spectrum of ischemic heart diseases and the possibility of being a risk factor for acute myocardial infarction (MI).

Patients & Methods: Thirty six (36) patients were included in the study: 22 of them have myocardial infarction (MI) and 14 have unstable angina (UA). Risk factors and history of stable angina (SA) were reviewed and studied by Chi square. Complete blood count and platelet volume indices (PVI): mean platelet volume (MPV), platelet large cell ratio (P-LCR), and platelet distribution width (PDW) were done using automated hematology analysis system and studied by t-test and correlation analysis. All P values were

two sided and P value of < 0.05 was considered statistically significant.

Results: It is found that MPV and P-LCR were the most significant parameters that showed statistical difference between patient with UA and those with MI ($P=0.042$ & $P=0.031$) respectively unlike other parameters (platelets count or PDW) ($P=0.703$ & $P=0.094$). There were no correlations between MPV & other platelet indices with existing past history of SA as well as other risk factors for acute coronary syndrome ($P=0.811$).

Conclusion: Because it is simple, economic, and practical, MPV and P-LCR can be used in predicting the possibility of acute thrombosis in patients with coronary artery diseases.

Key words: Platelets, platelet volume indices, atherosclerosis, myocardial infarction, unstable angina, coronary artery disease.

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Introduction

Coronary atherosclerosis and its complication like myocardial infarction (MI) are the major causes of morbidity and mortality in industrialized countries. Endogenous and exogenous risk factors exist but they only explain part of the case, other relevant risk factors need to be identified^(1, 2, 3).

Platelets have been implicated in the pathogenesis of cardio-vascular disorders including atherosclerosis and its complication like acute myocardial infarction (AMI), unstable angina (UA) and sudden cardiac death⁽⁸⁾.

After rupture of arteriosclerotic plaque in coronary arteries, platelets hyperactivity and local platelets activation have been suggested to play a causal role in prothrombotic events leading to MI^(1, 2, 4, 5). An increased platelet reactivity and shortened bleeding time are associated with increased platelet volume⁽⁶⁾, therefore; platelet size has been considered to reflect platelet level of activity^(2,4) as the large platelets are metabolically and enzymatically more active than small platelets^(1,7) and they have a higher thrombotic potential due to high concentration of thromboxane A2^(1,2,4,8,9).

Various studies found an association between mean platelet volume (MPV) and coronary artery disease⁽¹⁰⁾ or the occurrence of an acute MI^(1,2,9,10,11), while others found no such effect⁽¹²⁾. The biological and

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