



TO STUDY PLATELET INDICES IN ISCHEMIC HEART DISEASES IN TERTIARY CARE HOSPITAL.

Medical Science

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ABSTRACT

Background: Ischemic heart diseases are mainly caused by atherosclerosis. Platelets play key role in development and progression of IHD. Platelet parameters are detected earlier than markers of myocardial infarction. Larger platelets are enzymatically active than smaller platelets. **Aims:** To study changes in platelet indices in ischemic heart diseases and predict their usefulness in acute coronary syndrome. **Methods:** Cross sectional observational study was done for a duration of 18 months in tertiary care hospital in 185 patients with 46 Acute myocardial infarction patients, 46 unstable angina, 46 stable angina and 47 healthy controls were taken. Venous blood samples were taken within 30 min of admission or OPD patients collected in EDTA tubes. Platelet indices like MPV, PDW, P-LCR and P-LCC were assessed using MINDRAY BC 6200. **Results:** The platelet indices like MPV, PDW, P-LCR, P-LCC were increased in case groups (AMI and Unstable angina) (9.2, 14.2, 27.2, 80.5) than control groups (Stable angina and Healthy controls) (8.2, 12.3, 24.1, 38.5). **Conclusion:** Platelet indices were increased in acute coronary syndrome patients than healthy controls. Platelet volume indices is feasible and easy reliable test. Hence can be used in initial evaluation of patients with acute coronary syndrome.

KEYWORDS

Platelet indices, IHD, ACS.

INTRODUCTION

Ischemic heart disease is defined as myocardial impairment due to imbalance between coronary blood flow and myocardial requirement. Platelet hyperactivity and local platelet activation play a role in acute coronary events. Larger platelets are metabolically and enzymatically active than smaller platelets. The platelet indices correlate with functional status of platelets and is emergent risk factor for atherothrombosis¹. The most sensitive and specific biomarkers of myocardial damage are troponin I and troponin T, levels of which begin to rise at 2 to 4 hours of myocardial infarction and peak at 48 hours. Creatine kinase enzymes begins to rise within 2-4 hours, peaks at about 24 hours and return to normal within 72 hours². The platelets vary in size and activity^{3,4}. The size of activated platelets can be determined by their greater MPV and PDW. Greater adhesiveness and a propensity for aggregation are found in larger platelets⁵. The increase in platelet volume will make ACS patients more likely to develop coronary thrombus⁶. Platelets parameters can be detected earlier as compared to specific and non-specific markers of myocardial infarction. These are easily recorded by automated cell counter and routinely available in most clinical laboratories. There is a scope to make better use of platelet parameters generated, as patients with larger platelets can easily be identified during routine hematological analysis and could possibly benefit from timely treatment^{7,8}.

Aims and Objectives

- 1) To study the platelet volume indices in all ischemic heart diseases
- 2) To compare platelet indices in acute coronary syndrome and in non-acute coronary syndrome.
- 3) To assess their usefulness in predicting acute coronary syndrome.
- 4) To compare platelet indices in stable and unstable angina

METHODS

Cross sectional observational study was done for a duration of 18 months in tertiary care hospital in 185 patients in which 4 groups were taken. These groups were acute myocardial infarction, unstable angina, stable angina and healthy controls. Acute myocardial infarction patients-46 cases, unstable angina-46 cases, stable angina-46 cases and healthy controls-47 were taken. Venous blood samples were taken within 30min of admission or OPD patients collected in EDTA tubes. Informed consent was taken. Platelet indices like MPV, PDW, P-LCR and P-LCC were assessed using MINDRAY BC 6200.

Table no :1 MPV, PDW, P-LCR, PL-LCC in Comparison

Group	MPV (fl)	PDW (%)	P-LCR (%)	PL-LCC ($10^3\mu m^3$)
MI	9.7	14.2	29.2	96
Unstable angina	9.5	14.6	27.1	65
Stable angina	8.5	12.5	24.2	44
Healthy controls	8.2	13.2	24.1	33

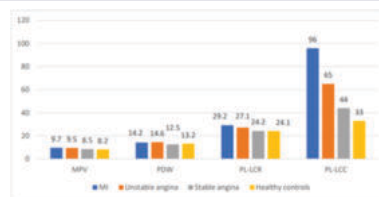


Figure: 1

Table No.: 2 Platelet Volume Indices Within The Groups.

ANOVA test

Platelet volume indices	P value
MPV between groups	<0.001 (highly significant)
PDW between groups	<0.001 (highly significant)
PLCR between groups	<0.001 (highly significant)
PL-LCC between groups	<0.001 (highly significant)

Table no: 3 Comparison of MPV PDW P-LCR And PL-LCC Between Cases and Controls.

	Mean value			
	MPV	PDW	PL-LCR	PL-LCC
CASES (MI GROUP AND UNSTABLE ANGINA GROUP)	9.2	14.2	27.2	80.5
CONTROL (STABLE ANGINA AND HEALTHY GROUP)	8.2	12.3	24.1	38.5

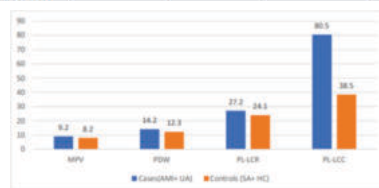


Figure no: 2

Table no: 4 Comparison of MPV PDW P-LCR and PL-LCC Between Cases and Controls

"t" test

Platelet volume indices	P value
MPV	<0.001 (highly significant)
PDW	<0.001 (highly significant)
PL-LCR	<0.001 (highly significant)
PL-LCC	<0.001 (highly significant)

RESULTS

Studies	MPV	PDW	P-LCC	P-LCR
Randheer et al	11.44±1.23	-	-	-
Abdullah et al	8.99± 1.5	15.88±1.5	-	-
Khandekar et al	10.43±1.03	13.19±2.34	-	29.4±7.38
Our study	9.2	14.2	80.5	27.2

Randheer et al. did a study in 2014 in SMS Medical College, Rajasthan on 215 eligible patients to investigate whether there is an association between MPV measurement and cardiac Troponin I (cTn I) in patients with suspected diagnosis of ACS. There is seen increased MPV than controls⁹.

Abdullah et al. did a study in Kingdom of Saudi Arabia in 2011. The MPV was significantly larger in MI cases compared to controls (8.99±1.5fL vs 8.38±0.5fL respectively, P value <0.001)¹⁰.

M M khandekar et al MPV, PDW and P-LCR were significantly raised in myocardial infarction patients. Presence of larger platelet is probably the risk factor for development of coronary artery thrombosis and MI¹¹.

Also in our study, platelet parameters such as MPV, PDW, P-LCR and P-LCC are significantly increased than controls.

Mean Platelet Volume

Our study showed that mean platelet volume (fl) in MI group was 9.2, UNSTABLE ANGINA group was 9.5, STABLE AP group was 8.5 and HEALTHY CONTROLS was 8.2. Mean platelet volume were comparable between four groups with high statistically difference of 0.0001 (<0.5).

Platelet Distribution Width And ACS

In our study mean value of in cases (AMI group and UNSTABLE ANGINA group) was 14.2% and controls (STABLE ANGINA and Healthy group) were 12.3%. Statistically high significance was detected in PDW between cases and control. (P value <0.001).

Platelet-large Cell Ratio And ACS

In our study mean value of P-LCR in cases (AMI group and UNSTABLE ANGINA group) was 27.2 and controls (STABLE ANGINA and Healthy group) were 24.1. Statistically high significance was detected in P-LCR between cases and control. (P value <0.001).

Platelet-large Cell Count And ACS

In our study mean value of P-LCC in cases (AMI group and UNSTABLE ANGINA group) was 80.5 and controls (STABLE ANGINA and Healthy group) were 38.5. Statistically high significance was detected in PL-LCC between cases and control. (P value <0.001).

CONCLUSION

- 1) When compared to stable angina pectoris and healthy controls platelets volume indices is found to be increased in ACS group
- 2) Statistically significant difference in platelets volume indices was found to exist between cases and controls.
- 3) Platelet volume indices is feasible and easy reliable test; thus, it can be used for the initial evaluation of patients with ACS along with other cardiac markers.

Future Scope

Platelet volume indices can be used in the initial evaluation of patients with ACS along with other cardiac markers.

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