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A Study on Mean Platelet Volume in Acute Ischemic Stroke

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Abstract
The Aim of this study is to find the significance of Mean Platelet Volume (MPV) in Acute Ischemic Stroke. This study was conducted among 50 patients diagnosed with Acute Ischemic Stroke within 72 hours of onset of symptoms and a control group of 50 patients. Patients with Age more than 40 years and admitted with diagnosis of Acute Ischemic Stroke within 72 hours from the onset of symptoms were included in the study. Patients with Age less than 40 years, Acute Hemorrhagic Stroke, Acute Coronary Syndrome, Diabetes Mellitus, Malignant Disorders, Platelet count below 100 and above 450 x 10^3 / µl and patients on Anti-Platelet drugs were excluded from the study. Our study showed a significant difference in MPV between the study group and control group with the P value of < 0.05

Keywords- *Mean platelet volume, Ischemic stroke.*

Introduction

Platelet size, measured as Mean Platelet Volume (MPV), a marker of platelet function is a physiological variable of haemostatic importance [(1)]. Normal range of Mean platelet volume is from 7.2 to 11.7fl [(2)]. Large platelets are metabolically more reactive, produce more prothrombotic factors and aggregate more easily [(3,4,5)]. They also contain more dense granules and release more serotonin and beta thromboglobulin than do small platelets [(6)]. Mean platelet volume, as well as platelet count, are an index of haemostasis and its dysfunction i.e. thrombosis. Changes in MPV play a more important role in haemostasis than platelet count.

Aim of the Study

To compare the mean Mean Platelet Volume (MPV) in Acute Ischemic Stroke with Normal individuals.

Materials and Methods

Study Design

Hospital based Case Control study.

Sample Size

This study was conducted among 50 patients diagnosed with Acute Ischemic Stroke within 72 hours of onset of symptoms and a control group of 50 patients. Cases and controls were age and sex matched.

Study Methods

Mean Platelet Volume (MPV) was taken at the time of admission. Mean Platelet Volume (MPV) was one among the value in Complete Blood Count (Cell counter analyzer) report. This Complete Blood Count investigation is a basic investigation routinely done for all patients admitted in Rajah Muthiah Medical College Hospital. Statistical comparison was done using independent sample 'T' test.

Study Duration

Patients presenting with Acute Ischemic Stroke from October 2015 to September 2016.

Study Place

The Department of Medicine, Rajah Muthiah Medical College Hospital.

Inclusion criteria for study group

Patients with Age more than 40 years and admitted with diagnosis of Acute Ischemic Stroke within 72 hours from the onset of symptoms were included in the study.

Exclusion criteria for study group

Patients with Age less than 40 years, Acute Hemorrhagic Stroke, Acute Coronary Syndrome, Diabetes Mellitus, Malignant Disorders, Platelet count below 100 and above 450 x 10^3 / µl and Patients on Anti-Platelet drugs were excluded from the study

Inclusion Criteria for control group

Age more than 40 years, Patients admitted with general illness other than exclusion criteria.

Exclusion Criteria for control group

Age less than 40 years, Cerebrovascular Accident, Acute Hemorrhagic Stroke, Acute Coronary Syndrome, Diabetes Mellitus, Malignant disorder, Platelet count below 100 and above 450 x 10^3 / µl, Patients on Anti-Platelet drugs.

Results

Age wise MPV distribution

AGE GROUP	MEAN PLATELET VOLUME(MPV)	
	CASES	CONTROLS
41 to 50	12.7333	9.433
51 to 60	12.3643	9.107
61 to 70	12.4600	8.847
71 to 80	12.3900	9.060
81 to 90	12.5500	8.300

Mean MPV was found to be highest in the youngest study population (41-50 years) in both cases and controls.

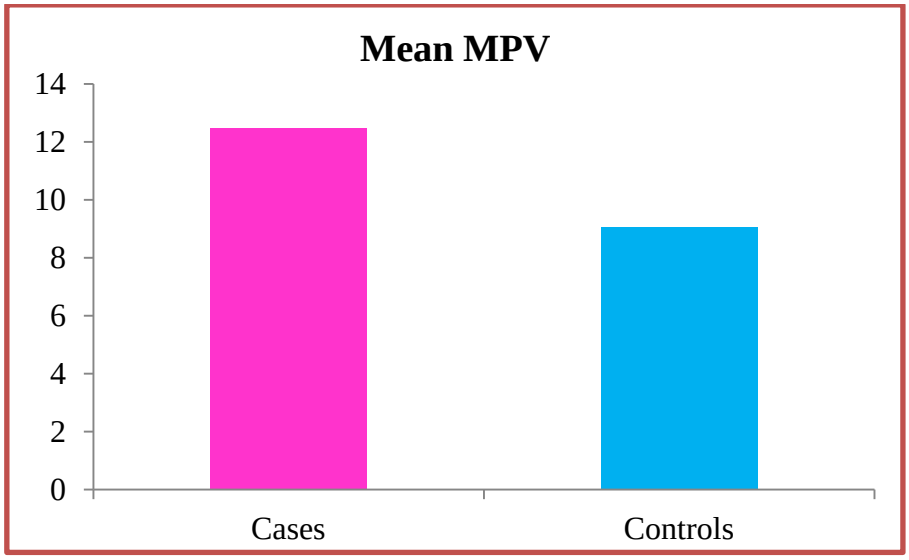
Sex wise MPV distribution

GROUP	MEAN PLATELET VOLUME(MPV)	
	Male	Female
	Mean ± SD	Mean ± SD
Cases	12.5±0.35	12.3±0.33
Controls	9.23±0.72	8.6±0.62

Mean MPV was found to be higher in males than females in both cases and controls.

Mean Platelet Volume (MPV) Distribution

	MPV		Mean Difference	T value	P value
	Mean	SD			
Cases	12.472	0.3614	3.4260	29.021	< 0.05
Controls	9.046	0.7525			



In study group Mean MPV is 12.472 and in control group Mean MPV is 9.046 which is statistically significant with the P value of < 0.05.

Discussion

In our study we compared MPV in 50 patients of Ischemic stroke and 50 normal persons. Both the groups are comparable by distribution of Age and sex. Many studies have demonstrated that diabetic patients have increased MPV than normal individuals.[7] So we excluded diabetic patients in our study. Increase in platelet volume has been reported as a risk factor for acute myocardial infarction,[7,8,9,10] acute cerebral ischemia,[11,12] transient ischemic attacks, and for death or recurrent vascular events after myocardial infarction [13,14]. Higher levels of MPV in patients with acute ischemic stroke have been demonstrated than in control subjects.[15] Our study also showed significant difference in Mean platelet volume between study and control group with the P value of 0.05. The severity and poor outcome of ischemic stroke patients with increased MPV has been reported in the literature.[16,17,18]

Conclusion

Mean platelet volume (MPV) is a very low cost investigation and can be obtained easily in most health care settings. Our study shows significantly higher MPV in patients with ischemic stroke. This suggests association of increased MPV with thromboocclusive arterial disease. Further study has to be done in a larger population to confirm its use as an adjunct to diagnosis.

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