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General Medicine

A STUDY TO EVALUATE THE MEAN PLATELET VOLUME IN TYPE 2 DIABETES MELLITUS

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ABSTRACT Autoimmune bullous diseases (AIBD) constitute a wide spectrum of dermatological disorders. The diagnosis is often Diabetes is one of the leading causes of mortality and morbidity. It is both a metabolic disorder and a major worldwide healt h problem becau of its high prevalence Platelet volume is a marker of platelet function and activation. It can be quantified as mean platelet volume (MPV) clinical hematology analyzers. Platelets from diabetic patients synthesize more thromboxane than normal platelets. Increased platelet activi enhances vascular complications in these patients. Platelets from diabetic patients synthesize more thromboxane than normal platelet Increased platelet activity enhances vascular complications in these patients. (2) In light of these findings, a study will be undertaken on me platelet volume in type 2. In this study, out of 250 subjects, 92% had MPV more than 7.5 and 8% had MPV below 7.5.

KEYWORDS : Mean Platelet Volume, Type 2 , Diabetes Mellitus

INTRODUCTION
Diabetes is one of the leading causes of mortality and morbidity. It is both a metabolic disorder and a major worldwide health problem because of its high prevalence.[1]

Platelet volume is a marker of platelet function and activation. It can be quantified as mean platelet volume (MPV) by clinical hematology analyzers. Platelets from diabetic patients synthesize more thromboxane than normal platelets. Increased platelet activity enhances vascular complications in these patients.[2]

The prevalence of diabetic complications are higher in people with poor glycemic control and long duration of diabetes mellitus (DM).(3) Poor glycemic control can be accurately measured by Glycosylated Haemoglobin (HbA1c). HbA1c reflects average plasma glucose over the previous 8 to 12 weeks.[4]

Diabetic nephropathy (DN) occurs in approximately one-third of all people with diabetes and is the leading cause of renal failure in developed and developing countries. Thus diabetic nephropathy is the leading cause of end-stage renal disease (ESRD). Microalbuminuria is the best predictor of diabetic nephropathy development in patients with type II diabetes mellitus.[5]

In light of these findings, a study will be undertaken on mean platelet volume in type 2 DM and its correlation with HbA1c and microalbuminuria.

MATERIAL AND METHODS:
All the diabetic patients Age ≥18 years with Type 2 diabetes mellitus patients who are on diet control, oral hypoglycemic agents or on insulin. Known case of malignancies.and platelet disorders will be excluded will undergo clinical examination. Venous blood samples will be collected in haemogram tubes with di-potassium EDTA sample and complete blood count will be tested within 1 hour of collection to minimize variations due to sample aging. MPV will be analyzed by Beckman Coulter LH 750 Hematology Auto-analyzer. HbA1c and microalbuminuria will be analyzed by immunoturbidimetric assay, in Rosche Diagnostic Cobas 6000 clinical chemistry auto-analyzer.

RESULTS
• A total of 250 subjects were chosen according to the selection criteria and this included 88 males and 162 females , Among the subjects the mean female age was 40 years in contrast with the mean male age being around 56 years. The mean HbA1c in males was 9.0 and females was 9.7. The study did not show any statistical significance between the male and female groups with respect to MPV, HbA1c . out of 250 subjects, 89% had MPV more than 7.5 and 11% had MPV below 7.5. . Among the subjects in the study 87% had an FBS value more than 126 and 13 % had an FBS value less than 126. This study has shown a significant correlation between MPV and FBS with a p value of < 0.001

DISCUSSION
The main reason for the abnormal platelet function in type 2 DM are

Bone marrow synthesize immature, larger and more reactive platelets. Platelets are activated when exposed to metabolic milieu in Type 2 DM. Platelets are activated due to vascular damage in type 2 DM. In diabetics platelets exhibit enhanced thromboxane production hence there is increased platelet activation .TXA2 production has been co related with fasting plasma glucose and HbA1c and improved glycemic control shown to reduce TxA2 production. [5] Predominantly larger platelet are circulating in type 2 DM patients and this leads to a more activated megakaryocyte – platelet system as larger and younger platelets are consider to be more active. Larger platelets that contain denser granules are metabolically and enzymatically more active that smaller ones and have higher thrombotic potential. MPV measures the size of platelet, so it is a marker of platelet function and activation. [5]

The platelet size distribution assessed by MPV correlates positively with the number of platelet glycoprotein on the platelet membrane, the thromboxane synthesizing capacity and the platelet granule contents of various platelet specific protein. [5] Hence increased mean platelet volume is linked with increased thrombotic potential. [5]

A study by Tuzcu et al [6] conducted an experiment with 192 patients and showed a correlation between MPV levels and diabetic retinopathy in which MPV levels were high.

Bath and Butterworth [7] showed a relationship between platelet function and diabetic complications. Cardiovascular complication prevalence of type 2 DM may be associated with HbA1c and MPV.

Schneider DJ [8] also suggested that hyperglycemia may intensify the platelet activity by increasing megakaryocytic glycoprotein production.

A study done by Kodiatte et al [9] showed significantly higher MPV in diabetic patients than in the non-diabetic subjects.

CONCLUSION
In this study, there is a significant association found between MPV and diabetes mellitus.
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