

Analysis of platelet clumping in portal hypertension

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Aim & objectives: 1. Study of the difference between manual and coulter platelet counts in study subjects, 2. Study of platelet clumping and immature platelet fraction, 3. To analyze the impact of thrombocytopenia and of von Willebrand factor (vWf) levels on survival in patients with acute-on-chronic liver cell failure (ACLF).

Methodology:

Chronic liver disease (CLD) was diagnosed based on history, investigations & imaging and PHT was diagnosed by gastroscopy. Those with cryptogenic CLD were recruited as cases and those with hepatitis HBV/HCV CLD, idiopathic thrombocytopenic purpura (ITP), aplastic anemia and constitutional macrothrombocytopenia and healthy volunteers were recruited as controls.

Platelet counts were done manually and by coulter method using both EDTA and citrated blood samples. Mean platelet volume (MPV) was estimated. Platelet clumping was also looked for. IPF was also measured in the study group. Corrected difference in platelet count was calculated using the formula (CDPC=manual count-coulter count/coulter count).

Plasma vWf Ag and activity was measured using EIA in patients with ACLF as per Asia Pacific Association for the Study of Liver criteria

Results:

50 cases [age 45 (10-73) years; median (range)], 44 HBV/HCV related CLD [age 46 (23-74) years], 13 patients with EHPVO [age 29 (13-55) years], 20 healthy controls [age 32 (21-63) years], 39 patients with ITP/aplastic anemia [age 34 (6-69) years] and 20 with CMT [age 49 (22-68) years] were included to study platelet count difference.

Higher mean platelet volume was noted in the study group and was significantly higher in cases compared to healthy controls [10 (7-16) fl Vs 8.7 (6.9-14.2)fl; p 0.001]. CDPC was significantly higher in cases compared to healthy controls [0.331 (-0.22-2.0) Vs 0.091 (-0.13-0.52); p 0.002]. 23 cryptogenic CLD, 14 hepatitis B or C related CLD and 19 healthy controls were included to study IPF.

IPF [6.3 (1.2-28.3%) Vs 3.1 (0.8-6.1%); p 0.002] was significantly higher in cases in comparison to controls. There was a strong significant positive correlation (r 0.640; p <0.001) between MPV and IPF.

50 patients with ACLF [Age 43(28-64) years] were included in this study. In hospital mortality was 42%. Patients who had adverse outcome had significantly higher vWf activity on admission and was showing a trend towards survival prediction after adjusting for MELD[632(119-1157) Vs 490 (97-986); p 0.025].As grade of ACLF increased vWf activity and mortality significantly increased (p <0.001) and there was a negative correlation between vWf activity and platelet count (r -0.136)

Conclusions:

We found higher manual platelet counts compared to coulter platelet counts in patients with PHT. The higher manual platelet counts are probably due to increased MPV. The increased platelet volume is probably due to release of immature platelets into the circulation. In patients with ACLF, we found markedly increased plasma vWf levels, and Correlation between severity of ACLF along with negative correlation with the platelet count. Elevated plasma vWf activity level showed a trend to be an independent predictor of in-hospital mortality.