Evaluation of Mean Platelet Volume Role in Prognosis of Spontaneous Bacterial Peritonitis

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INTRODUCTION

Patients with cirrhosis are usually prone to develop bacterial infections, primarily ascetic fluid infection (AFI),which is present in 15-25% of patients with cirrhosis and ascites***(Ngamruengphong et al, 2011),*** It is frequent and serious complication of cirrhotic ascites, It occur in the absence of intra-abdominal inflammatory focus, such as acute pancreatitis, cholecystitis, or abscess **(*Fernández et al, 2002)***.

For the diagnosis of AFI, polymorphonuclear (PMN) cell count of the ascetic fluid that is obtained by paracentesis must be ≥ 250/mm3.AFI consists of culture-negative neutrocytic ascites (CNNA) and spontaneous bacterial infection (SBP) regarding to bacterial culture results ***(Moore et al, 2006).***

Current literature data suggest that ascetic fluid analysis by paracentesis must be done for all patients with ascites that are admitted to hospital. Prompt result of ascetic fluid cell count is not always possible in practical setting, more over ascetic fluid culture always take several days to one week, which suggest that they cannot be used as screening tool ***(Wong et al, 2006).***

Despite early initiation of antibiotic therapy, which may result in satisfactory response in most cases, the mortality still remains considerably high at 30-50%, for this reason early determination of inflammatory activity has acrucial rule for the assessment of AFI and for therapeutic modifications, the adjuvant use of additional markers that are non-invasive, rapid and easily

applicable may add benefit for predicting the development AFI and achieving accuracy ***(Balagopal et al, 2010).***

Circulating platelets are abundant source of prothrombotic agents closely associated with inflammatory markers and play a key role in the initiation and propagation of vascular and inflammatory diseases **(*Kilciler et al, 2010)***.

Platelets are anucleate cell and their size mostly depends on degree of fragmentation of megakaryocytes,those with increased size have agreater content of granules and can there for exert their hemostatic and pro-inflammatory actions with great efficiency , for this reasons mean platelets volume(MPV) is proposed to be an indicator of platelet function and activation ***(Thompson et al, 1983).***

MPV is generated by full blood count analyzers as part of complete blood count (CBC). Some studies have reported that MPV increases by myocardial infarction, cerebrovascular disease, Alzheimer disease, hypertension and celiac disease ***(Yesilet al, 2012).***

In contrast it has been reported that MPV decreases in active inflammatory disease, including rheumatoid arthritis, ankylosing spondylitis, ulcerative colitis and acute pancreatitis **(*Beyazit et al, 2012),***It has been suggested that the dual role of this marker is largely influenced by the intensity of inflammation **(*Gasparyan et al, 2010)***.

Although *MPV* is well studied in number of prospective studies in different population of patients and several markers

were proposed for estimating systemic inflammation in patients with AFI such as leucocyte esterase reagent strips, PH, lactoferrin in ascetic fluid , plasma and ascetic fluid procalcitonin, However no data exists showing role of MPV in cirrhotic patients ***(Suvak et al, 2013).***

Aim of the work

The aims of study are:

- To investigate whether MPV is useful as a prognostic marker for follow up of treatment response in SBP.
- Analyze the overall accuracy of MPV in diagnosis of SBP

Subjects and Methods

Study design: prospective study.

Sample size:100

Study setting: This study will be conducted in Tropical Medicine department Ain Shams University Hospital.

This study will include:

Patients: 100 patients with stigmata of chronic liver disease based on clinical, laboratory and radiological data and diagnosed as cases of SBP (TLC in ascetic fluid ≥ 250 PMN /mm3).

Inclusion criteria:

- Adult Egyptian patients with clinical, laboratory and radiological evidence of liver cirrhosis and ascites with SBP.
- Signed informed consent.

Exclusion criteria:

- Patients with heart failure.
- Patients with hypertension
- Patient with hyperlipidemia.
- Patients with peripheral vascular disease.
- Patients with hematological and neoplastic disorders.
- Patients who had received antibiotics, anticoagulant medications, prior hospital admission.

All included patients will be subjected to the following: -

1) Clinical study: including

   a) Full history taking with special stress on:

      Abdominal pain, fever, symptoms of hepatic decompensation including jaundice, ascites, lower limb edema, hematemesis and hepatic encephalopathy, drug history, DM, HTN.

   b) Clinical examination including:

      1. General examination for stigmata of liver cell failure.
      2. Abdominal examination for Ascites, tenderness and rebound tenderness.

2) Laboratory investigation to assess severity of liver condition according to CPS score&diagnosis of SBP:

   a) Complete blood picture including MPV at time of diagnosis of SBP and after treatment.

b) Ascetic fluid analysis including (TLC in ascetic fluid & microbiological cultures) and follow up TLC in ascetic fluid 5 days after initiation of treatment.
c) Liver profile: ALT, AST, Bilirubin, Albumin, Prothrombin time and INR (International Normalized Ratio).
d) Kidney function tests: urea, creatinine.

3) Radiological investigations including abdominal ultrasonography.

***Data management and statistical analysis*:**

Data will be collected and recorded on specific forms. Data validation will be ensured before statistical analysis will be performed.

SPSS statistical package will be used. Results tabulation will be performed fulfilling the main aim of the study.

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First of all, thanks to GOD for his grace and mercy, and for giving me the effort to complete this work.

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Last, but certainly not least, I owe to the patients included in this study, the whole of it. May God alleviate their sufferings and may all our efforts be just for their own benefit.

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List of Abbreviations

AFI	Ascetic fluid infection
AFP	Alpha fetoprotein
ALT	Alanine Transaminase
AST	Aspartate Transaminase
Bili	Bilirubin
BT	Bacterial translocation
CARD 15	Caspase recruitment domain 15
CBC	Complete blood count
CNNA	Culture negative neutrocytic ascites
CPS	Child Pugh score
Cr	Creatinine
CRP	C reactive protein
Dl	Deciliter
DM	Diabetes mellitus
EDTA	Ethylene diamine tetra acetic acid
ELISA	Enzyme linked immunosorbent assay
ESR	Erythrocyte sedimentation rate
FC	Fecal calprotectin
GI	Gastrointestinal
HBA1c	Glycated hemoglobin
HCC	Hepatocellular carcinoma

HDL	High density lipoprotein
HLA	Human leucocytic antigen
HPS	Hepatopulmonary syndrome
hsCRP	high-sensitivity C-reactive protein
HTN	Hypertension
IL 1b	Interleukin 1b
IL6	Interleukin 6
INR	International normalized ratio
LC	Liver cirrhosis
LDH	Lactate dehydrogenase
LDL	Low density lipoprotein
LER	Leukocyte esterase reagent
MELD	Model for end-stage liver disease
Mg	Milligram
MI	Myocardial infarction
Ml	Milliliter
MLN	Mesenteric lymph node
Mm	Millimeter
MPC	Mean platelet component
MPV	Mean platelet volume
MRSA	Methicillin resistant staphylococcus aureus
NOD	Nucleotide-binding oligomerization domain
NSBB	Non selective beta blocker

PCT	Procalcitonon
PDW	Platelet distribution width
PF	Platelet factor
PMN	Polymorphonuclear
PPI	Proton pump inhibitor
RA	Rheumatoid arthritis
RES	Reticulo- endothelial system
ROC	Receiver operating characteristic
SAAG	Serum albumin ascetic gradient
SBP	Spontaneous bacterial peritonitis
SIBO	Small intestinal bacterial overgrowth
STATA	Statistics/Data analysis
TG	Triglycerides
TIPS	Trans jugular intrahepatic portosystemic shunt
TLC	Total leucocytic count
TLR	Toll like receptor
TNF a	Timor necrosis factor a
UC	Ulcerative colitis
WBC	White blood cell

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