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Research Article

Red Cell Distribution width among Patients Having Hepatitis C

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ABSTRACT

OBJECTIVE: determine frequency of increased RDW in patients with hepatitis C and to compare mean RDW among patients having compensated and decompensated liver cirrhosis.

SUBJECTS & METHODS: A total of 213 cases between 16 to 70 years of age, both males and females who are diagnosed cases of hepatitis C virus infection, both with compensated or decompensated liver disease were included in the study from Services Hospital, Lahore during 2016-17. Informed consent was taken. Patients with end stage renal disease, coronary artery disease, chronic hepatitis B virus and chronic heart failure were not included. Samples for complete blood picture were taken by trained nursing staff and sent to P.A.E.C Gen hospital laboratory. Reports were finalized by consultant pathologist. **RESULTS:** In our study, frequency of increased RDW in patients with hepatitis C was recorded in 35.21%(n=75). Mean RDW among patients having compensated and decompensated liver cirrhosis was done where mean RDW in compensated liver cirrhosis was calculated as 46.42$\pm$6.33 while 61.98$\pm$5.34 was recorded in decompensated liver cirrhosis, p value was calculated as 0.0001 showing a significant difference. **CONCLUSION:** We concluded that frequency of increased RDW in patients with hepatitis C is on acceptable level and mean RDW among patients having decompensated liver cirrhosis were significantly higher when compared with compensated liver cirrhosis. However, it is a single center study, which needs someother multicenter trials to validate our results.

KEYWORDS: Hepatitis C, compensated, decompensated, RDW

INTRODUCTION

Hepatitis C virus is most important cause of chronic liver disease. It is biggest health challenge facing the developing world. Today Pakistan is in the intermediate hepatitis C virus prevalence area. Hepatitis C virus affects more than 170 million people worldwide and 2.4 to 6.5 % people in Pakistan.[1]

The importance of hepatitis C is illustrated by the fact that these infections are imposing a heavy burden on national economy due to considerable morbidity and mortality from both acute and chronic sequale including chronic active hepatitis, cirrhosis and hepatocellular carcinoma.[2] Cirrhosis can be compensated or decompensated. Decompensated cirrhotic damage causes secondary complications such as portal hypertension, ascites, esophageal variceal bleeding, spontaneous bacterial peritonitis and hepatic encephalopathy. Screening for and management of these complications incurs substantial health care costs. [3] Treatment strategies of these sequale are based on various prognostic markers. There are number of prognostic classification as modifications of child grading and the model for end stage liver disease based on serum bilirubin, creatinine and INR, which is widely used as a predictor of mortality in patients awaiting liver transplantation.[4]

Red cell distribution width reflects the variability in circulating RBC sizes. Large values indicate greater variability. It is routinely

performed as a part of complete blood count and also used in differential diagnosis of anemia. RDW is elevated in cases when there is increased red cell destruction or ineffective red cell production. [5] Recently a series of studies regarding its association with different disease have demonstrated its association with severity of coronary artery disease and its adverse outcome, mortality in patients on chronic dialysis, acute pancreatitis, stroke, pulmonary hypertension and it amplifies the risk of death in chronic heart failure as well. [6, 7, 8, 9, 10, 11] Elevated RDW values were also shown to be associated with increased risk of mortality in general population. [5]

Red cell distribution is also increased in liver disease. It is found to be significantly higher in patients with decompensated liver disease (RDW: 18.30 ± 3.11 %) and compensated liver disease (RDW: 16.37 ± 2.43 %) than those in healthy population (RDW: 13.03 ± 1.33 %). Frequency of significantly increased RDW (> 20%) is found in 18.6% of patients with chronic hepatitis C[5]. There is also significant increase in RDW in patients with decompensated cirrhosis having worsening of child Pugh grade; however its clinical significance remains largely unknown. [12]

Present study is being carried out to determine, if RDW is elevated in patients with hepatitis C. RDW is easily available parameter in routine complete blood picture. If, my study reveals elevated RDW, then this parameter could be adapted for early management of patients accordingly.

METHODOLOGY

A total of 213 cases between 16 to 70 years of age, both males and females who are diagnosed cases of hepatitis C virus infection, both with compensated or decompensated liver disease were included in the study from Services Hospital, Lahore during 2016-17. We excluded all cases with End Stage Renal Disease, septic shock , coronary artery disease (CAD), chronic heart failure (CHF) or hepatitis B, as can cause raised RDW values so will be excluded. Patients having both hepatitis B and C will also be excluded. Informed consent was taken. Patients with end stage renal disease, coronary artery disease, chronic hepatitis B virus and chronic heart failure were not included. Samples for complete blood picture were taken by trained nursing staff and sent to P.A.E.C Gen hospital laboratory.

Reports were finalized by consultant pathologist. t test was applied to compare mean RDW value between two groups. P value ≤ 0.05 was significant.

RESULTS

Age distribution of the patients was done showing that 17.37%(n=37) were between 16-40 years while 82.63%(n=176) were between 41-70 years of age, mean±sd was calculated as 54.73±14.12 years. (Table No. 1)

Patients were distributed according to gender showing that 44.13%(n=94) were male while 55.87%(n=119) were females. (Table No. 2)

Frequency of compensated/decompensated liver cirrhosis shows that 69.48%(n=148) were compensated while 30.52%(n=65) were decompensated liver cirrhosis. (Table No. 3)

Frequency of increased RDW in patients with hepatitis C was recorded in 35.21%(n=75) while 64.79%(n=138) had no findings of the morbidity. (Table No. 4) Comparison of mean RDW among patients having compensated and decompensated liver cirrhosis was done where mean RDW in compensated liver cirrhosis was calculated as 46.42±6.33 while 61.98±5.34 was recorded in decompensated liver cirrhosis, p value was calculated as 0.0001 showing a significant difference. (Table No. 5)

TABLE No. 1: AGE DISTRIBUTION (n=213)

Age(in years)	No. of patients	%
16-40	37	17.37
41-70	176	82.63
Total	**213**	**100**
mean±sd	**54.73±14.12**	

TABLE No. 2: GENDER DISTRIBUTION (n=213)

Gender	No. of patients	%
Male	94	44.13
Female	119	55.87
Total	**213**	**100**

TABLE No. 3: FREQUENCY OF COMPENSATED/DECOMPENSATED LIVER CIRRHOSIS (n=213)

Type of cirrhosis	No. of patients	%
Compensated	148	69.48
Decompensated	65	30.52
Total	**213**	**100**

TABLE No. 4: FREQUENCY OF INCREASED RDW IN PATIENTS WITH HEPATITIS C (n=213)

Increased RDW	No. of patients	%
Yes	75	35.21
No	138	64.79
Total	**213**	**100**

TABLE No. 5: COMPARISON OF MEAN RDW AMONG PATIENTS HAVING COMPENSATED AND DECOMPENSATED LIVER CIRRHOSIS (n=213)

Type of cirrhosis	Mean	SD
Compensated	46.42	6.33
Decompensated	61.98	5.34

P value=0.0001

DISCUSSION

In our study, out of 213 cases, 69.48%(n=148) were compensated while 30.52%(n=65) were decompensated liver cirrhosis. Frequency of increased RDW in patients with hepatitis C was recorded in 35.21%(n=75). Mean RDW among patients having compensated and decompensated liver cirrhosis was done where mean RDW in compensated liver cirrhosis was calculated as 46.42±6.33 while 61.98±5.34 was recorded in decompensated liver cirrhosis, p value was calculated as 0.0001 showing a significant difference.

In a previous study, frequency of significantly increased RDW (> 20%) is found in 18.6% of patients with chronic hepatitis C[5]. Another study recorded that there is also significant increase in RDW in patients with decompensated cirrhosis having worsening of child Pugh grade.[12]

YuFeng Lou and others[13] investigated the association between RDW values and different disease states in hepatitis B virus (HBV)-infected patients. In addition, they analyzed whether RDW is associated with mortality in the HBV-infected patients, they recorded that RDW values at admission in patients with Chronic Severe Hepatitis B (18.30±3.11%, P<0.001), Chronic Hepatitis B (16.37±2.43%, P<0.001) and acute hepatitis B (14.38±1.72%, P<0.05) were significantly higher than those in healthy controls (13.03±1.33%). Increased RDW values were clinically associated with severe liver disease and increased 3-month mortality rate. Multivariate analysis demonstrated that RDW values and the model for end-stage liver disease score were independent predictors for mortality (both P<0.001), though the mentioned study was not done in hepatitis C virus but the hypothesis of their study that "RDW values are significantly increased in patients with hepatitis B and associated with its severity" correspond to our findings. They also revealed that RDW values are an independent predicting factor for the 3-month mortality rate in patients with hepatitis B.

Karagoz E and others[14] aimed to investigate the relationship between the severity of fibrosis and red blood cell distribution width (RDW), platelet distribution width (PDW), mean platelet volume (MPV), and MPV and red blood cell distribution width to platelet ratio (RPR) in patients with chronic hepatitis B (CHB) and concluded that MPV and RDW values are significantly higher in hepatitis B virus-infected patients, associated

with severity, and can be defined as independent predicting factors in hepatic fibrosis. This study also supports our hypothesis.

Our results may not be proper to be generalized because of the single center character of our work. RDW measurement was performed based on a single value and cannot consider the relationship between possible timely changes and clinical parameters. However, great sample size and low missing data rates strengthen our results. RDW is easily available parameter in routine complete blood picture and on the basis of our results, it may be adapted for early management of patients accordingly. Someother trials may validate our findings.

CONCLUSION

- We concluded that frequency of increased RDW in patients with hepatitis C is on acceptable level and mean RDW among patients having decompensated liver cirrhosis were significantly higher when compared with compensated liver cirrhosis. However, it is a single center study, which needs someother multicenter trials to validate our results.

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