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Red Cell Morphology as A Predictor of Esophageal Varices in Cirrhotic Patients

F.M.Khalil[1], M.A.Al Assal[2], A.M.Hussein[1], A.K.El Alfy[1] and N.A.Abdellatif[1]
[1]Internal Medicine, Faculty of Medicine, Benha Univ., Benha, Egypt
[2] Hepatology and Gastroenterology Unit, Internal Medicine, Faculty of Medicine, Benha Univ., Benha,. Egypt
E-Mail: Noura2000@gmail.com

Abstract

Cirrhosis is within the top 20 causes of disability-adjusted life years and years of life lost, accounting for 1.6% and 2.1% of the worldwide burden. This investigation means to survey Red Cell Morphology as A Predictor of Esophageal Varices in Cirrhotic Patients. An aggregate of 100 cirrhotic cases were incorporated and they were isolated dependent on endoscopic discoveries into two gatherings: varices bunch which included 87 cases with esophageal varices, and non-varices bunch which included 13 cases without esophageal varices. The mean age was 61.07 and 64.54 years in variceal and non-variceal bunches individually. In the variceal gathering, we included 64 guys (73.6%) and 23 females (26.4%). In the non-variceal gathering, 9 guys (69.2%) just as 4 females (30.8%) were incorporated. Both age and sexual orientation were not altogether extraordinary between the two gatherings ($p > 0.05$). All CBC boundaries including RDW were not altogether extraordinary among variceal and non-variceal gatherings ($p > 0.05$), aside from haematocrit worth and mean corpuscular hemoglobin, which were fundamentally diminished in the variceal gathering ($p = 0.014$ and 0.025 separately). Zone under bend (Auc) for RDW cv and sd in forecast of oesophageal varices was 0.571. RDW is anything but a critical indicator of esophageal varices nearness in cirrhotic people.

Keywords: Red Cell Morphology, Esophageal Varices, Liver cirrhosis**.**

1. Introduction

Liver illness represents roughly 2 million passings for every year around the world, 1 million because of entanglements of cirrhosis and 1 million because of viral hepatitis and hepatocellular carcinoma. Cirrhosis is as of now the eleventh most regular reason for death universally and liver malignancy is the sixteenth driving reason for death; consolidated, they represent 3.5% of all passings around the world. Cirrhosis is inside the best 20 reasons for handicap balanced life forever and a day of life lost, representing 1.6% and 2.1% of the overall weight [1].

Cirrhosis results from dynamic fibrosis and is the ultimate result of all constant liver malady. Cirrhosis can bring about entrance hypertension and additionally hepatic brokenness. Both of these either alone or in blend can prompt numerous entanglements, including ascites, varices, hepatic encephalopathy, hepatocellular carcinoma, hepatopulmonary condition, and coagulation issues. Cirrhosis and its confusions weaken personal satisfaction as well as reduction endurance [2].

Entry hypertension can prompt the development of venous guarantees, biochemical (expanded creation of vasoconstrictors, vascular endothelial development factor, nitric oxide, and other splanchnic vasodilators), and practical variations from the norm (plasma volume extension, and expanded heart yield), and accordingly adds to the pathogenesis of numerous inconveniences of cirrhosis [3].

Liver biopsy is as yet considered the best quality level analytic strategy to recognize the run of the mill highlights of cirrhosis. Elective analytic techniques have been approved in contrast with liver biopsy and have a decent symptomatic exactness for the analysis of cirrhosis. As a result, the utilization of liver biopsy has significantly diminished over the most recent 10 years; in any case, it stays an essential analytic apparatus when attending likely etiological components for liver illness exist together and when the ID of highlights other than fibrosis prompts changes in the clinical administration of patients, for example, on account of intense or ceaseless liver injury [4].

The red cell dissemination width (RDW) is a mechanized proportion of red platelet size heterogeneity (for example anisocytosis) and routinely proceeded as a piece of a total platelet checks. It is to a great extent neglected, and considered a recently perceived hazard marker in different infections [5].

RDW is utilized in the differential conclusion of frailty. The estimation of RDW in evaluating the seriousness of ailment and clinical result has been demonstrated in different conditions including, however not restricted to sepsis, renal brokenness, cardiovascular, aspiratory infections, and malignancies. RDW was additionally demonstrated valuable in surveying death rates and endurance of hospitalized patients, including those admitted to the emergency unit.

RDW values are altogether expanded in patients with hepatitis B and related with its seriousness. Be that as it may, as far as we could possibly know, the job of RDW values foreseeing liver cell disappointment and gateway hypertension in cirrhosis has not been very much characterized. The current examination was intended to explore the job of RDW as a non-obtrusive file for anticipating liver cell disappointment and entry hypertension in cirrhotic patients which will improve the symptomatic productivity [7].

The point of study was to evaluate the morphology of red cells as an indicator of esophageal varices in cirrhotic understanding.

2. Patients and methods

This is a prospective cross-sectional study that was conducted over a period of one years, on adult patients diagnosed with liver cirrhosis at Benha University Hospitals, This study aims to assess Red Cell

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The study included 100 cirrhotic cases who were divided based on endoscopic findings into two groups:

Varices group: which included 87 cases with esophageal varices.

Non-varices group: which included 13 cases without esophageal varices.

1.1 Inclusion criteria

- Age: between 18 – 70 years.
- Patients with liver cirrhosis based on history, clinical examination, and laboratory investigations.

1.2 Exclusion criteria

- Iron deficiency anemia.
- Patients suffering from hematemesis for less than 1 month.
- Patients with congestive heart failure or acute myocardial infraction.
- Pregnancy induced hypertension.

An informed consent was obtained from all parents of the diseased cases before participating in the study. Besides, the study was approved by the local ethical committee.

All patients were assessed by the same medical team with standard evaluation approach. Patients were subjected to full history taking, clinical examinationand laboratory assessment as complete blood count including RDW, Liver enzyme: Alanine Transaminase (ALT), Aspartate Aminotransferase (AST), serum alkaline phosphatase. Liver functions: albumin, bilirubin, Prothrombin Time (PT), International normalized ratio (IINR). Serum creatinine.

Radiological investigations: Abdominal ultrasonography was performed in all cases in order to detect:

- Size of liver and spleen.
- Hepatic focal lesions
- Presence of Cirrhosis.
- Degree of ascites.
- Diameter of portal vein.
- Blood flow velocity and direction in the portal vein.
- Presence of portosystemic collaterals.

Upper GIT endoscopy was done using disinfected upper gastrointestinal video scope (OLYMPUS model) after good preparation of the patient. Complete evaluation of the esophagus، stomach and the duodenum down to the second part of the duodenum.

1.3 Statistical analysis

The clinical data were recorded on a report form. These data were tabulated and analysed using the computer program SPSS (Statistical package for social science) version 20 to obtain: Descriptive statistics were calculated for the data in the form of: Mean and standard deviation $(\pm SD)$. for quantitative data. Frequency and distribution for qualitative data. Analytical statistics: In the statistical comparison between the different groups, the significance of difference was tested using one of the following tests. Student's t-test test: - Used to compare mean of two groups of quantitative data. ANOVA test (F value): -Used to compare mean of more than two groups of quantitative data. Inter-group comparison of categorical data was performed by using fisher exact test (FET). P value <0.05 was considered statistically significant (*) while >0.05 statistically insignificant P value <0.01 was considered highly significant (**) in all analyses.

3. Results

The mean age of the included cases was 61.52 years (range 42 – 75). We included 73 males (73%) in addition to 27 females (27%) in the current study. On performing upper GIT endoscopy, 13 cases (13%) were free from oesophageal varices, whereas the remaining 87 cases (87%) had varices. Small varices were detected in 44 cases (44%), followed by medium varices (29%), while large varices were found in 14 cases (14%) Table (1).

Table (1) Distribution of the studied group (n=100).

Oesophageal varices	**No (100)**
Age Mean ±SD (range)	61.52±10.12 (42.0-75.0)
Sex n(%)	
Male	73(73.0)
Female	27(27.0)
Oesophageal varices	
No	13(13.0)
Small	44(44.0)
Medium	29(29.0)
Large	14(14.0)

All CBC parameters were not significantly different between variceal and non-variceal groups ($p > 0.05$), apart from haematocrit value and mean corpuscular haemoglobin, which were significantly reduced in the variceal group ($p = 0.014$ and 0.025 respectively). Of note, red cell distribution width did not differ between the two groups ($p = 0.097$) Table (2).

Table (2) CBC parameters between the study groups**.**

Oesophageal varices	No (13)		Yes (87)		Statistical test (st t)	P value
	Mean	±SD	Mean	±SD		
Hb	9.75	1.95	9.55	1.99	0.35	0.73
Hct	35.05	12.7	29.64	6.08	2.52	0.014*
MCV	78.69	18.35	78.16	10.8	0.15	0.88
MCH	28.66	3.39	25.9	4.18	2.27	0.025*
MCHC	33.22	1.32	32.5	2.31	1.09	0.28
RDW cv	24.83	14.68	22.16	8.72	0.93	0.35
RDW sd	40.25	20.76	47.52	13.52	1.68	0.097

All CBC parameters did not differ significantly between different variceal grades, apart from mean corpuscular volume, and mean corpuscular haemoglobin (p = 0.015 and 0.001 respectively) Table (3).

Table (3) CBC parameters according to variceal grade.

	No varices (13)		Small (44)		Medium (29)		Large (14)		Statistical test (F)	P value
	Mean	±SD	Mean	±SD	Mean	±SD	Mean	±SD		
Hb	9.75	1.95	9.48	2.34	9.81	1.62	9.22	1.48	0.35	0.79
Hct	35.05	12.7	29.92	7.33	29.05	4.69	30.0	4.22	2.17	0.097
MCV	78.69	18.35	74.15	12.62	82.13	5.81	82.56	7.81	3.65	0.015*
MCH	28.66	3.39	24.5	4.58	27.06	2.76	27.9	3.96	5.86	0.001**
MCHC	33.22	1.32	32.02	2.49	33.17	1.83	32.65	2.43	2.07	0.11
RDW cv	24.83	14.68	23.91	10.15	18.9	2.39	23.41	10.68	2.01	0.12
RDW sd	40.25	20.76	46.15	14.15	50.26	12.36	46.16	13.9	1.44	0.24

ROC curve was used to assess the validity of RDW cv and RDW sd in prediction of oesophageal varices; Area under curve (Auc) for RDW cv in prediction of oesophageal varices is 0.571. Best cut of point which show the validity of RDWcv was 16.95 at which sensitivity and specificity were 80.5, 53.8 respectively this was p value<0.013. Area under curve (Auc) for RDW sd in prediction of oesophageal varices is 0.571. Best cut of point which show the validity of RDWsd was 41.95 at which sensitivity and specificity were 77, 69.2 respectively this was (p value<0.002) Fig (1).

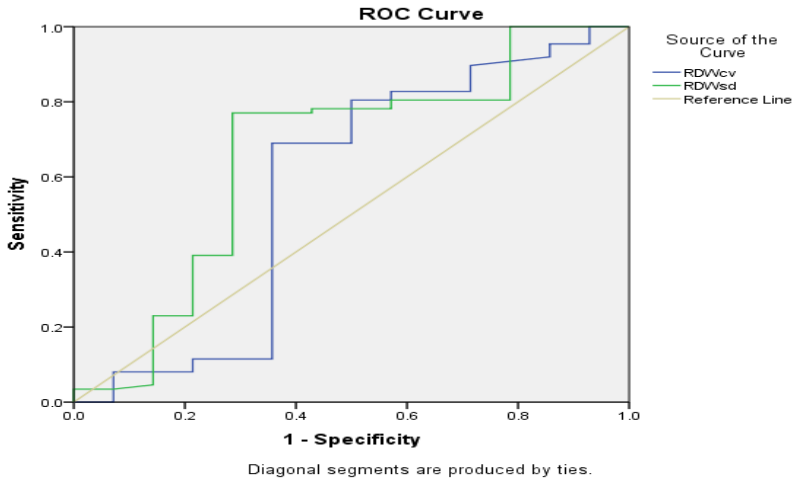

Fig (1) Receiver operator Characteristic curve (ROC) curve for analysis

4. Discussion

We incorporated an aggregate of 100 cirrhotic cases, who were isolated into two gatherings as per the nearness or nonappearance of esophageal varices. The main gathering included 13 cases (13%) without varices, while the subsequent gathering included 87 cases (87%) with varices.

Anther study dealing with a similar point of view incorporated a sum of 146 cases, who were separated into two gatherings; non varices (25.34%), and variceal gathering (74.66%) [8].

The mean age of the included cases was 64.54 and 61.07 years in non-varices and varices bunches individually. No critical contrast was distinguished between the two gatherings with respect to this boundary

(p = 0.25). What's more, age was not measurably huge between cases with various variceal grades (p = 0.84).

Another investigation additionally detailed that age didn't establish a critical contrast between the two gatherings (p = 0.06) [8]. This comes in accordance with our outcomes.

In the current investigation, we included 9 guys (69.2%) and 4 females (30.8%) in the non-varices gathering, while the variceal bunch included 64 guys (73.6%) just as 23 females (26.4%). Sex didn't comprise a huge variable between the two examination gatherings (p = 1). Additionally, it was not noteworthy when contrasting the variceal subgroups (p = 0.84).

Another investigation additionally announced that sexual orientation was likewise not a hazard factor for varices. The commonness of guys was 75.5% and 65.1% in the non-variceal and variceal bunches individually (p = 0.236) [8]. This concurs with our examination results.

In our investigation, all RBCs lists including RDW were not altogether unique between the two gatherings (p > 0.05), aside from the hematocrit worth and mean corpuscular hemoglobin, which were fundamentally diminished in the variceal gathering. Contrasting variceal subgroups uncovered that cases and medium and huge varices were having altogether raised MCV and MCH contrasted with little and non-variceal gatherings.

Another investigation likewise revealed that RBCSs check and hemoglobin focus didn't vary between non-variceal and variceal gatherings (p = 0.967 and 0.235 separately) [9]. This concurs with our investigation results, yet that paper did exclude other RBC lists as we did.

Sarangapani et al. [10] likewise revealed no criticalness between the two gatherings with respect to hemoglobin focus (p = 0.43). The equivalent non-huge connection between hemoglobin fixation and varices was likewise affirmed in another examination [11].

RDW mirrors the inconstancy in flowing RBC size. It depends on the width of the RBC volume dissemination bend, with bigger qualities demonstrating more prominent inconstancy. The liver is the biggest organ in the body and is liable for separating unsafe compound substances; collection of poisons may influence the size of RBCs and in this way the RDW esteems. Hence, we guess this is a significant factor that impacts malady movement, and may introduce a significant indicator record for LCF [12].

RDW might be firmly connected with high grimness and mortality, and have indicated that it is a free indicator of high horribleness and mortality in different kinds of harm, diabetes, and cardiovascular, thromboembolic, renal, liver and provocative sicknesses [13].

Another investigation detailed that high RDW (≥ 14.5%) was unequivocally connected with high hazard upper gastrointestinal draining [14].

As of late, a few examinations have explored the relationship among RDW and the seriousness of constant liver infections including nonalcoholic greasy liver ailment, alcoholic cirrhosis, and essential biliary cirrhosis [15].

In any case, Milic et al. [16] found that a factually noteworthy increment in RDW pertinent to the malady seriousness was not seen in neither in gatherings of patients with alcoholic cirrhosis nor with nonalcoholic cirrhosis.

Moreover, different creators found a fundamentally decent connection between's Child–Pugh and RDW values which can at last be utilized to foresee the endurance of patients with liver cirrhosis. There was additionally acceptable connection among's RDW and those getting B-blockers, so it might be utilized as a pointer for quiet consistence, yet there was no critical relationship with the evaluation of encephalopathy and entryway hypertension [17].

5.Conclusion

Based on our study findings, it was evident that RDW is not a significant predictor of esophageal varices presence in cirrhotic individuals. However, it is recommended to conduct more studies regarding that parameter to reach a conclusive result.

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