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Research Article

RED CELL DISTRIBUTION WIDTH (RDW) IN PATIENTS WITH ACUTE PANCREATITIS

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Abstract:

OBJECTIVE: To determine the red cell distribution width (RDW) in patients with acute pancreatitis.

PATIENTS AND METHODS: The one year hospital based cross-sectional multidisciplinary and multicenter study (2015-2016) was conducted at tertiary care hospitals and the data was also recruited from few private hospitals. All the patients known presented with severe acute pancreatitis were recruited and studied. After taking clinical history, physical examination and routine investigations, the patients fulfilling the Branch of Gastroenterology, Chinese Medical Association criteria for acute severe pancreatitis were explored for RDW whereas the frequency / percentages (%) and means \pm SD computed for study variables.

RESULTS: During two year study period total fifty patients were explored and study. The mean \pm SD for age (yrs) of population was 39.83 ± 7.72 . Regarding gender male 30 (60%) and female 20 (40%), residence urban 23 (46%) and rural 27 (54%) while the RDW was raised in 35 (70%), normal 07 (14%) and low 08 (16%) patients whereas the mortality was observed as 6(12%) and 01 (2.0%) in patient having raised and low RDW respectively. **CONCLUSION:** Acute pancreatitis has higher RDW and there is association between RDW and mortality in patients with AP.

KEYWORDS: Red cell distribution width (RDW), Acute pancreatitis and Mortality

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INTRODUCTION:

Red cell distribution width (RDW) is a widely used laboratory parameter for the quantification of the extent of erythrocyte anisocytosis, calculated by dividing SD of red blood cells (RBCs) volume by mean corpuscular volume (MCV) and multiplying by 100 to express the results as percentages, and reflects the variability of the size of the circulating erythrocytes.^{1,2} Studies have reported that RDW as a strong and independent prognostic marker has been used in many pathophysiological conditions.^{2,3} Acute pancreatitis (AP) is a common surgical acute abdomen and is often complicated with systemic inflammatory response syndrome and multiple organ failure.⁴ Early predictive scores of SAP included Ranson and APACHE II scores, the testing parameters in the two scores are expensive and not conducive to clinical implementation.⁵ RDW value has scarcely been investigated as a potential prognostic biomarker in AP in our population. Therefore, this study aimed to investigate RDW in patients with AP at governmental as well as private hospital.

PATIENTS AND METHODS:

The one-year hospital based cross-sectional multidisciplinary and multicenter study (2015-2016) was conducted at tertiary care hospitals and the data was also recruited from few private hospitals. All the patients known presented with severe acute pancreatitis were recruited and studied while the exclusion criteria were patients with acute intermittent porphyria, intestinal perforation, iron deficiency anemia, pancreatic and hematological malignancies and pregnant women. After taking clinical history, physical examination and routine investigations, the patients fulfilling the Branch of Gastroenterology, Chinese Medical Association criteria for acute severe pancreatitis were explored for RDW. The data was collected on pre-designed proforma and analyzed in SPSS to manipulate the mean \pm SD, frequencies and percentages.

RESULTS:

During two year study period total fifty patients were explored and study. The mean \pm SD for age (yrs) of population was 39.83 \pm 7.72. The demographical and clinical profile of study population is presented in Table 1.

TABLE 1: THE DEMOGRAPHICAL AND CLINICAL PROFILE OF STUDY POPULATION

Parameter	Frequency (N=50)	Percentage (%)
AGE (yrs)		
20-29	05	10
30-39	10	20
40-49	12	24
50-59	10	20
60-70	08	16
70+	05	10
GENDER		
Male	30	60
Female	20	40
RESIDENCE		
Urban	23	46
Rural	27	54
BLOOD BIOCHEMISTRY	MEAN \pm SD	
WBC $\times 10^9/L$)	7.95 \pm 3.86	
RBC $\times 10^{12}/L$	4.72 \pm 2.42	
PLT $\times 10^9/L$	190.73 \pm 88.82	
RDW (%)	18.3 \pm 2.62	
RDW		
Raised	35	70
Normal	07	14
Low	08	16
MORTALITY		
Raised RDW	06	12
Normal RDW	00	00
Low RDW	01	2.0

DISCUSSION:

The high level of RDW is a novel prognostic marker that may reflect an underlying inflammatory state.⁶ AP is an inflammatory disease, and its mechanism is still not completely understood and early pathophysiological events escape clinical observation.⁷ Early deaths (within the first week) due to severe AP is generally caused by massive inflammatory responses. Narci H, et al found a significantly lower RDW level in patients with acute appendicitis compared with those in the control group.⁸ The mechanisms underlying the association between RDW and mortality in AP are unclear and has been observed that RDW may also be related with inflammation, and not only with anaemia.^{9,10} Moreover, RDW has been found to be strongly associated with inflammatory markers (e.g. CRP or erythrocyte sedimentation rate) in a large cohort of unselected outpatients.¹¹ Elevated levels of inflammatory cytokines and alterations in iron metabolism together with inflammatory states may decrease endothelial nitric oxide production, which is known to stimulate the proliferation of erythroid progenitor cells, and be implicated in the development of anaemia and change of RDW.¹²

CONCLUSION:

Acute pancreatitis has higher RDW and there is association between RDW and mortality in patients with AP. Therefore large and advance studies are required to clarify whether RDW is a prognostic marker in patients with acute pancreatitis.

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