

**ORIGINAL RESEARCH**

# RDW as A Novel Indicator For Severity And Prognosis In Acute Pancreatitis

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**ABSTRACT**

**Background:** The mild acute pancreatitis is a self-limiting disease that ranges about 80–90% of patients with only minimal or transitional systemic manifestations, but about 20–30% of patients develop a severe disease that can progress to systemic inflammation and cause pancreatic necrosis, multi-organ failure, and potentially death. **Objective:** To assess predictive outcome of Acute Pancreatitis based on RDW value. **Methods:** About 123 patients were recorded and observed, who are diagnosed as acute pancreatitis at the time of admission in surgical department at Karnataka institute of medical science hubballi, karnataka. **Result:** The number of people who are diagnosed acute pancreatitis are more in the age group 30-39 yrs by about 34.2% (around 44 patients) among 123 total acute pancreatitis patients. The distribution of acute pancreatitis is more in males in the age group 20-29 years. Among 123 patients (91.1%) of the acute pancreatitis have alcoholic history. **15 patients (12.2%)** of the acute pancreatitis was found to have increased RDW. 45 patients (97.8%) of the acute pancreatitis were discharged was found to have increased RDW. Around 2.2% patients had death was found to have increased RDW. **Conclusion:** RDW being a simple parameter which is easily available in a simple routine CBC thus, can be used as a novel predictor of acute pancreatitis. It is a cost effective measure for predicting acute pancreatitis prognostic value. **Keywords:** RDW, acute pancreatitis, Severity, Prognosis

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**INTRODUCTION**

The overall mortality rate of Acute pancreatitis (AP) is 2–5%, but the mortality of severe acute pancreatitis (SAP) may range up to 20–30%. So it is important to assess the disease severity in a timely and accurate manner to provide comprehensive treatment to AP patients, which will allow the clinician to consider more aggressive interventions to prevent adverse outcomes and decrease the high mortality of SAP. Also reliable markers or score systems predicting the severity of AP is of clinical importance for the management of Acute Pancreatitis. Red cell distribution width is a parameter of red blood cell which measures the variation in red cell size or volume.<sup>1</sup>

If RDW is elevated in complete blood count, it means that there is increased variation in size of red blood cell in peripheral blood smear.<sup>2</sup> RDW can be reported either as coefficient of variation (CV) that is RDW CV or it can be expressed as standard deviation (SD) that is RDW-SD.

The early prediction of severity in acute pancreatitis is still one of the main challenges in clinical practice. Currently several clinical factors including age, obesity, alcohol consumption and smoking predisposing to a severe disease course have been identified. There are variety of Score Systems such as

Ranson's Criteria, Acute Physiology and Chronic Health Evaluation (APACHE) II and Computed Tomography Severity Index (CTSI). But these systems have their own distinct pros and cons. The Ranson's Criteria is relatively accurate at classifying the severity of AP, but the evaluation cannot be completed until 48 hours, which will miss the potential for early recognition of SAP, its aggressive treatment and hence increase mortality.<sup>3-5</sup> Channelling the resources in identifying SAP in early stages is important so that intensive care can be started early and also less critical cases can be managed in the ward.

The APACHE II system allows the determination of disease on the first day of admission and is more accurate than Ranson's Criteria but it is a little complicated.<sup>6</sup> So, the aim of this study was to devise a low cost scoring system suitable for the Indian population in determining the severity of acute pancreatitis and predicting the prognosis and clinical outcome in these patients

**MATERIAL AND METHODS**

This Prospective Observational study was conducted among Patients diagnosed has acute pancreatitis and undergoing treatment at the DEPARTMENT OF GENERAL SURGERY KARNATAKA INSTITUTE

OF MEDICAL SCIENCES, HUBBALLI. This study was conducted from November 2018 to December 2020. Ethical approval was taken from IEC before commencement of study.

### SAMPLE SIZE

Sample size was calculated using the formula:

$$n = \frac{Z^2 pq}{d^2}$$

Where

Z= standard normal variant value

p= proportion or prevalence of interest

q =100-p

d=clinically acceptable error

P= 0.079, 7.9 per 100000

D=2%

Z=1.96

Sample size was 123

### INCLUSION CRITERIA

1. Age > 20 and <80 years
2. All patients admitted and diagnosed as acute pancreatitis in surgical ward at kims hospital hubballi

### EXCLUSION CRITERIA

1. Patients with age less than 18 year
2. Patients with age more than 80 year

### DATA COLLECTION AND METHODS

Patients selected for observational study as per inclusion / exclusion criteria are subjected to detailed history taking, clinical examination and relevant investigations.

Routine blood investigations- complete blood count [TC/RBS /Hb/RDW /platelet]

Patients aged between 20 and 80 years, diagnosed with acute pancreatitis of one year or more were included in the study.

Patients with chronic pancreatitis and age group above 80 year were excluded from the study.

The characteristics of the patients including age, gender, duration of symptoms, history of alcoholic or non alcoholic and other medical conditions were recorded on a standardized data collection form.

Blood samples were drawn and the complete blood count was determined by Beckman Coulter's Automated Haematology Analyzer.

RDW was recorded and observed in a cases of acute pancreatitis.

The normal RDW range was taken between Standard Deviation (SD) - 37-56fl (femtolitre)

The normal RDW-CV range was taken between 11.5-14.5 (percentage.)

All the data obtained were entered in the proforma (enclosed). Data were analyzed using SPSS package and by chi-square tests.

### RESULTS

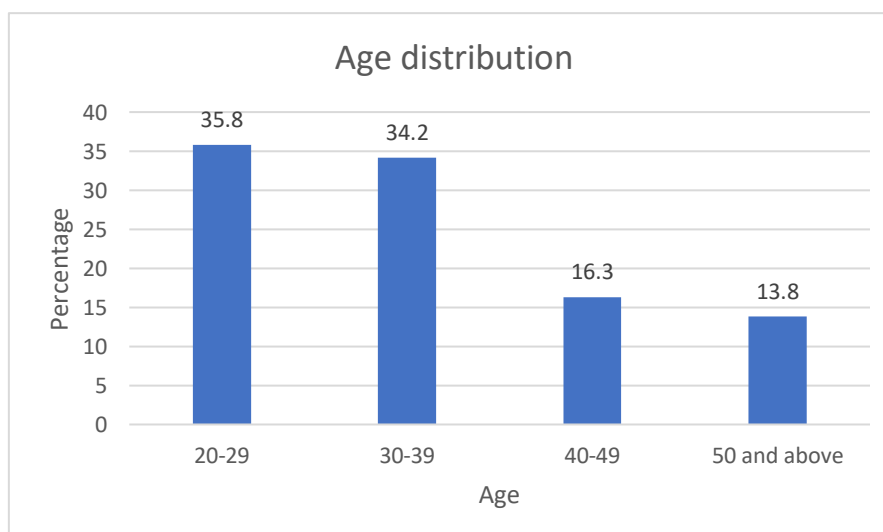
The number of people who are diagnosed acute pancreatitis are more in the age group 30-39 yrs by about 34.2% (around 44 patients) among 123 total acute pancreatitis patients. In the age group between 20-29 yrs (around 42 patients) the number of pancreatitis are more by 35.8%. The distribution of acute pancreatitis is more in males in the age group 20-29 years

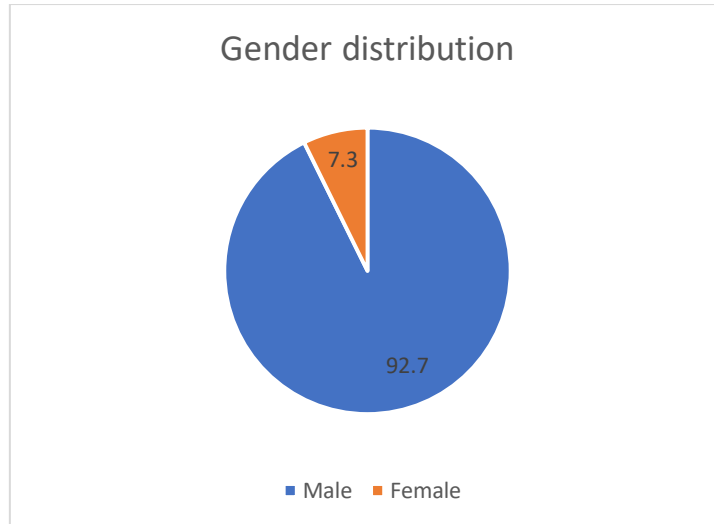
RDW is more in the acute pancreatitis group i.e.12.2% (around 15 patients) of the individuals enrolled for the study had increased RDW,SD. RDW,SD is normal in remaining patients.

RDW -CV is more in the acute pancreatitis group i.e. 37.4% (around of the individuals enrolled for the study had increased RDW ,CV. RDW,CV is normal in remaining patients

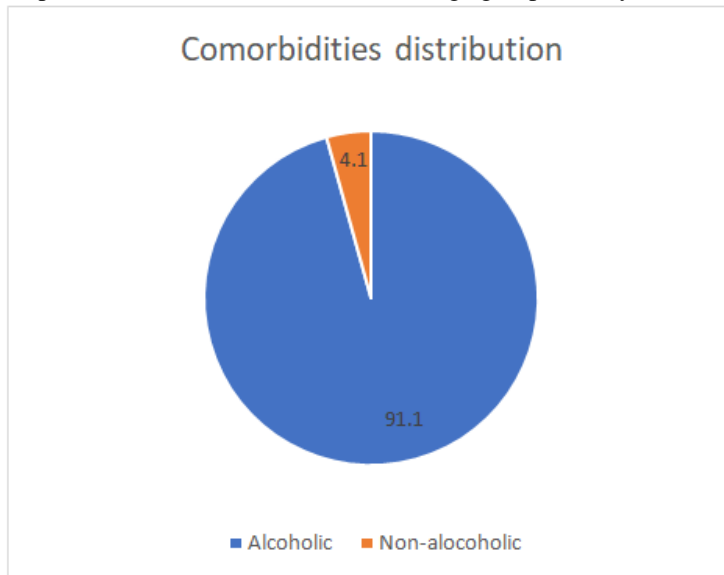
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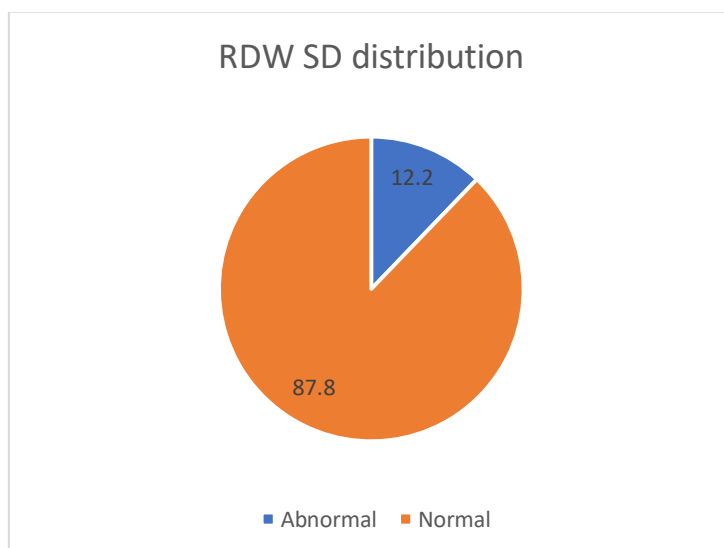




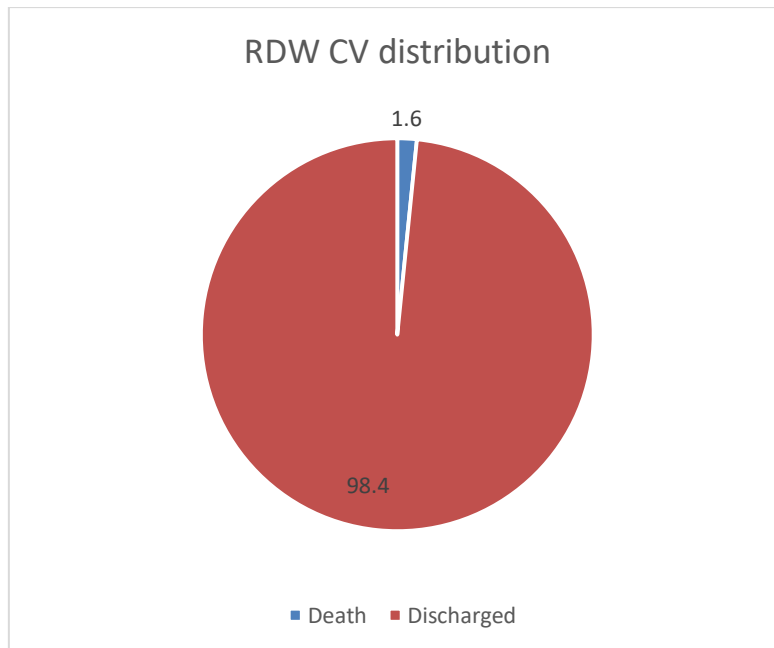
The distribution of acute pancreatitis is more in males in the age group 20-29 years



Among 123 patients (91.1%) of the acute pancreatitis who were enrolled in to the study was found to have alcoholic history .

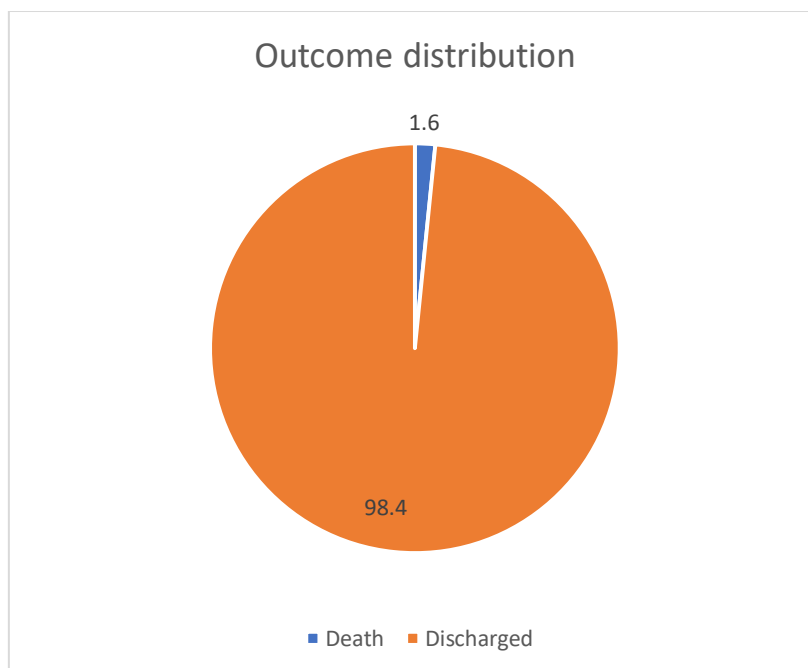


**Among 123 patients around 15 patients (12.2%)** of the acute pancreatitis who were enrolled in to the study was found to have increased RDW (Pearson Chi-Square=14.206\*\* **P=0.595**)

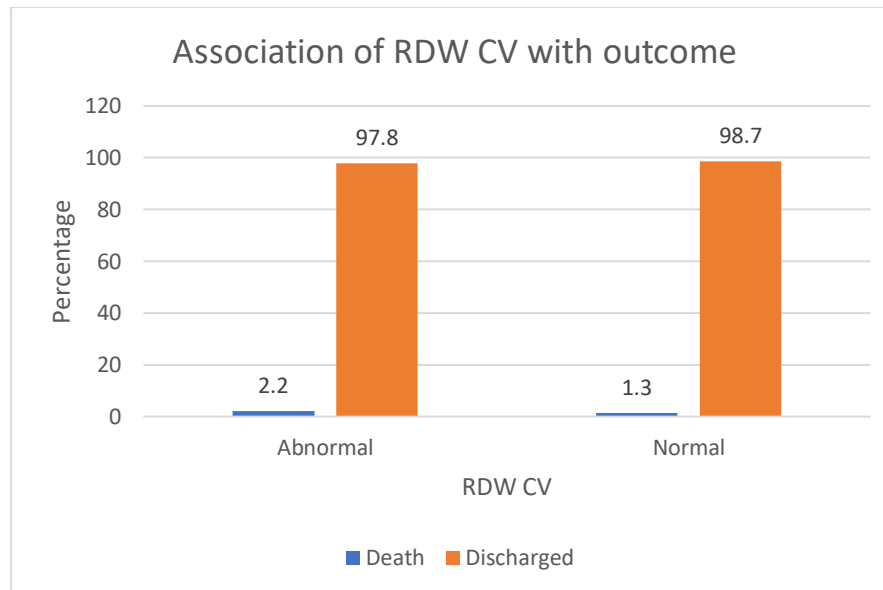


Among 123 patients around 45 patients (97.8%) of the acute pancreatitis were discharged who were enrolled in to the study was found to have increased RDW

Around 2.2% patients had death who were enrolled in to the study was found to have increased RDW (Pearson Chi-Square=14.206\*\* **P=0.710**)



**Among 123 patients 121 patients (98.4%)** of the acute pancreatitis who were enrolled in to the study was found discharged and around **2 patients (1.6%)** was found death .( **P=0.00**)



**Among 123 patients around 45 patients (97.8%)** of the acute pancreatitis were discharged who were enrolled in to the study was found to have increased RDW. Around 2.2% patients had death who were enrolled in to the study was found to have increased RDW (**P=0.710**)

Among 123 patients around 15 patients (100%) of the acute pancreatitis who were enrolled in to the study was found to have increased RDW (**P=0.595**)

Among 123 patients 121 patients (98.4%) of the acute pancreatitis who were enrolled in to the study was found discharged and around 2 patients (1.6%) was found death. (**P=0.001**)

## DISCUSSION

These cases were analysed and they were examined in detail and were selected based on inclusion and exclusion criteria. They were advised to do complete blood count, RBS, Hb, and were asked about history of alcohol intake and smoking and other comorbidities. The results were analysed and observational study was done. The results obtained were analysed using various statistical tests like chisquare, ANOVA and P value were obtained.

In a study conducted by, Kazım Şenol MD, Barış Saylam MD, Fırat Kocaay MD, Mesut Tez MD Department of Surgery, Ankara Numune Training and Research Hospital, Bahçelievler, Ankara, Turkey .<sup>7</sup>

This study shows Red cell distribution width on admission is a predictor of mortality in patients with AP Another study conducted by ,Erdinç Çetinkaya, Kazım Şenol, Barış Saylam, and Mesut Tez Shows , Red cell distribution width to platelet ratio: New and promising prognostic marker in acute pancreatitis<sup>8</sup>

In this study, One-hundred and twenty-three patients with acute pancreatitis with both alcoholic and nonalcoholic were included in the study.<sup>9</sup>

And all these cases were analysed for complete blood count, random blood sugar , amylase levels and

were analysed after adjusting for age, hb, cbc and RDW, SD whose normal value is between 37-54 femtolitre (FL)RDW,CV whose normal value is between 11.5-14.5 percentage (%) was analysed and it was found out in this study that RDW was found to be higher at the time of admission in acute pancreatitis.

## CONCLUSION

Out of 123 patients with acute pancreatitis among these 46 patients had shown elevated RDW-CV . Among 123 patients 15 patients were shown elevated rdw-SD, out of 46 among elevated rdw patients two 2 had mortality, Thus this study can be used as prognostic parameter in those patients who are diagnosed as acute pancreatitis with elevated RDW levels helps in prognostic indicator at admission of acute pancreatitis patients.

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