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**ORIGINAL ARTICLE**

# Non ST Elevation Myocardial Infarction: Correlation of RBC Distribution Width with Syntax Score

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## ABSTRACT

**Background and objective:** RDW (Red blood cells distribution width) is basically a numerical value and measure of the variability in size of erythrocytes. The main objective of the study is to analyse the correlation of RBC Distribution width with syntax score.

**Material and methods:** This correlational study was conducted in Shalamar Medical & Dental College Lahore During June 2020 till December 2020. The data was collected from 120 patients. The age range for this study was 25 to 60 years and patients with non-STEMI undergoing invasive coronary angiography were included in the study. A comprehensive clinical history along with detailed history for major risk factors for IHD was taken from all patients followed by detailed clinical examination.

**Results:** The data was collected from 120 patients of NSTEMI patients. There were 85 males and 35 females and mean age was 54.25±5.67 years. There were no statistical difference between low and intermediate SYNTAX group patients. There were 65.78% patients who had the history of smoking and 34.9% patients with hypertension.

**Conclusion:** It is concluded that there is a strong and positive correlation between mean RDW and mean SYNTAX score in patients of non-ST elevation myocardial infarction.

**Key words:** RDW, Score, Erythrocytes, SYNTAX

## INTRODUCTION

RDW is a mathematical worth proportion of the changeability in size of coursing erythrocytes. High RDW esteems show more noteworthy variety in size than late examinations have shown, demonstrating that high RDW esteems are an autonomous indicator of forecast in patients with cardiovascular illnesses like intense myocardial dead tissue and non-ST rise myocardial localized necrosis (NSTEMI)[1].

Regardless of advances in analysis and treatment, ST-portion rise myocardial dead tissue (STEMI) stays the most widely recognized reason for CVD issues and horribleness in both creating and created countries[2]. It is significant to recognize high-hazard patients who will require quick and escalated treatment for myocardial localized necrosis (MI). Apoplexy and aggravation assume a significant part not just in the pathophysiology of intense ischemic conditions, yet additionally during the time spent atherogenesis, particularly in the movement of disease[3].

Red cell dispersion width (RDW) is a proportion of variety in the size of circling red platelets and is regularly announced as a feature of a mechanized full blood count. Ongoing examinations have detailed a solid autonomous connection between raised RDW and short-and long haul visualization in different issues like coronary course sickness (CAD), fringe vascular illness, MI, intense and constant cardiovascular breakdown and aspiratory embolism, just as in everybody[4].

IHD is the sequel of atherosclerosis. Inflammation has a role in the formation and rupture of athermanous plaques as well as thrombosis[5]. It is considered an indicator for inflammation plus a biomarker of worsening atherosclerosis. RDW is an integral part of automated complete blood picture that represents variation in volume and size. RDW is obtained by dividing the standard deviation of variation in the size of circulating red blood cells to mean red cell volume that is multiplied by 100 and expressing the result as percentage. The normal RDW value ranges between 11-16%[6]. RDW has also been shown to have a good relation for prognosis in patients of acute coronary syndrome patients[7].

The basic aim of the study is to analyse the correlation of RBC Distribution width with syntax score.

## METHODOLOGY OF THE STUDY

This cross sectional study was conducted in Shalamar Medical & Dental College Lahore during June 2020 till December 2020. The data was collected from 120 patients. The age range for this study was 25 to 60 years and patients with non-STEMI undergoing invasive coronary angiography were included in the study. A comprehensive clinical history along with detailed history for major risk factors for IHD was taken from all patients followed by detailed clinical examination. 5ml blood sample was taken for the blood analysis in all patients. The blood was then centrifuged at 3000rpm and serum was separated for further biochemical analysis. Coronary artery lesion with a diameter narrowing of ≥ 50% in an artery ≥ 1.5 mm size was scored separately and added to provide cumulative SYNTAX score. On the basis of SYNTAX score the patients were sub-classified into low score (SS<22) intermediate score (SS 22-32) and high score (SS>33) groups. . RDW was labelled on the basis of ratio of red blood cells volume S.D of variation to mean corpuscular volume and multiplied by 100 expressing as a percent.

The data was collected and we analysed the data by using SPSS version 19. All the uantitative values were expressed in mean and standard deviation.

## RESULTS

There were 120 patients of NSTEMI which were included in this study. There were 85 males and 35 females and mean age was 54.25±5.67 years. There were no statistical difference between low and intermediate SYNTAX group patients. There were 65.78% patients who had the history of smoking and 34.9% patients with hypertension. Table 01 shows the demographic characteristics of selected patients.

Table 01: Demographic characteristics of patients

| Variables | % age |
|---|---|
| Age | 54.25±5.67 |
| Male | 85 |
| Female | 35 |
| Smoking | 65.78 |
| Hypertension | 34.9 |
| Metabolic syndrome | 45.98 |
| History of heart diseases | 18.9 |
| Dyslipidemia | 24.6% |
| CABG surgery | 41.2% |

Table 02: Laboratory parameters of patients

| Characteristics | Low score | Intermediate score | High score | P-value |
|---|---|---|---|---|
| Hb | 12.92±2.43 | 13.01±3.43 | 13.92±3.61 | 0.031 |
| WBC | 10987.13±2650 | 10987.13±2650 | 10254.13±2410 | 0.065 |
| Platelet | 271294±81116 | 281091±51116 | 281284±52116 | 0.051 |
| Trop-I | 1.11±1.36 | 1.18±1.0 | 1.41±0.8 | 0.001 |
| CK | 73.7±69.5 | 78±51.45 | 71.41±55.4 | 0.001 |
| RBS | 169.15±58.63 | 153.48±63.44 | 183.15±69.18 | 0.019 |
| CRT | 0.99±0.17 | 1.02±0.14 | 1.12±0.20 | 0.0001 |

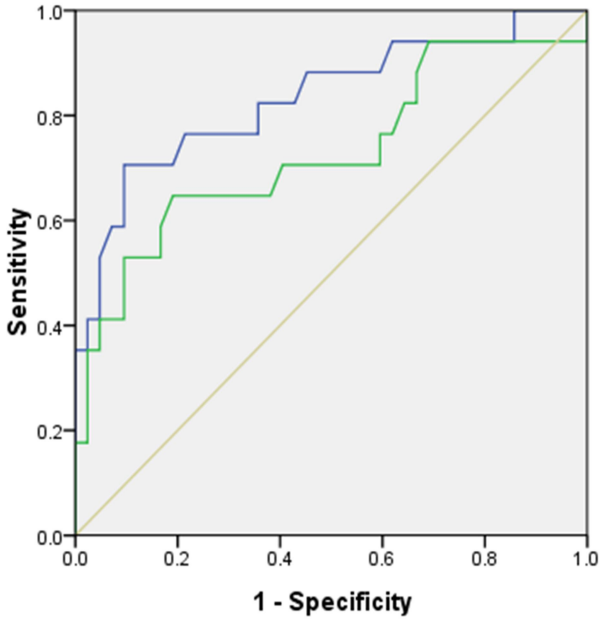


Figure 01: ROC curve of syntax score of patients in low, intermediate and high score groups

## DISCUSSION

We showed a positive relationship between undeniable degrees of RDW and the seriousness of coronary conduit sickness in patients with NSTEMI. We additionally exhibited that undeniable degrees of RDW on confirmation connected with a high SXscore. In spite of the fact that age, troponin level and LVEF anticipated all-cause mortality, no affiliation was found[8].

It is considered as a marker of the changeability in erythrocyte volume is a regularly accessible part of the total blood count. In patients with insufficient red cell creation (like iron lack, B12 or folate inadequacy and hemoglobinopathies), expanded red cell obliteration (like hemolysis) and blood bonding, the RDW levels can be raised. Coronary corridor illness (CAD) and other vascular problems are essentially the aftereffect of atherosclerosis[9]. The important risk factors causing atherosclerotic coronary artery disease are smoking, hypertension, diabetes mellitus and hyperlipidemia. Today modern research has shown some novel risk factors such as inflammation being implicated in pathogenesis of atherosclerosis[10].

Inflammation has been linked to different cardiovascular and cerebrovascular disorders. Inflammation has been linked to the process of initiation and continuation of athermanous plaque including its rupture and related thrombosis[11]. Bone marrow responds to inflammation by releasing premature cells like neutrophils and red blood cells. There is also small rise in inflammatory biomarkers like hs-CRP, neutrophils and red blood cells[12].

## CONCLUSION

It is concluded that there is a positive correlation in mean RDW and mean SYNTAX score of all patients with non-ST elevation myocardial infarction. RDW is considered as an important risk factor for mortality and cardiovascular events in patients with SCAD or acute coronary syndrome.

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