Red cell distribution width

Red cell distribution width (RDW) is a measure of the variation in size of red blood cells in the blood. It is typically reported as a percentage and is often included as part of a complete blood count (CBC) test.

RDW can be a useful diagnostic tool in the evaluation of anemia, which is a condition characterized by a decrease in the number of red blood cells or hemoglobin in the blood. An increase in RDW may indicate that there is a wider range of red blood cell sizes in the blood, which can be a sign of anemia due to various causes such as nutritional deficiencies, chronic diseases, or genetic disorders.

In addition to its role in the diagnosis of anemia, RDW has been studied as a potential marker of inflammation and cardiovascular disease. In some studies, a higher RDW has been associated with worse outcomes in conditions such as heart failure and stroke.

However, RDW is not a specific marker for any particular condition, and its clinical significance may vary depending on the underlying cause of the abnormality in red blood cell size distribution. Further testing and evaluation may be necessary to determine the underlying cause of any abnormalities in RDW levels.

Palabiyik et al. retrospectively analyzed intensive care unit patients with traumatic brain injury. They recorded patients' ages; genders; diagnosis; Glasgow Coma Scale scores; length of intensive care unit stay (in days); mean platelet volume, platelet distribution width, platelet count-to-total lymphocyte count ratio, and red cell distribution width values upon hospital admission; and health on the 7th and 30th days of their stays.

They analyzed data from 110 patients. Of these, 84 (76.4%) were male and 26 (23.6%) were female. On the 7- and 30-day mortality evaluations, compared to the living patients, the deceased patients had a significantly higher median age and a significantly lower median Glasgow Coma Scale. Thus, increased age and lower Glasgow Coma Scale scores were associated with increased 7- and 30-day mortality rates. mean platelet volume and platelet distribution width values were similar in living and deceased patients. platelet count-to-total lymphocyte count ratio values were lower in deceased patients, but this difference was not statistically significant. Within 30 days after traumatic brain injury, deceased patients' red cell distribution width values were significantly elevated in deceased patients compared to those of living patients.

Mean platelet volume, platelet distribution width, and platelet count-to-total lymphocyte count ratio values were not associated with 7- and 30-day mortality, whereas only elevated red cell distribution width was associated with 30-day mortality [1)].

Neutrophil to lymphocyte ratio (NLR), platelet to lymphocyte ratio, the systemic immune inflammation index (SII), and red blood cell distribution width (RDW), have been recognized as promising predictors for histological grade and prognosis in multiple cancer types.

Red cell distribution width (RDW) is a prognostic biomarker and associated with mortality in cardiovascular disease, stroke and metabolic syndrome. For elderly patients, malnutrition and

multiple comorbidities exist, which could affect the discrimination ability of RDW in sepsis. The main purpose of a study was to evaluate the prognostic value of RDW in sepsis among elderly patients.

This was a retrospective cohort study conducted in emergency department intensive care units (ED-ICU) between April 2015 and November 2015. Elderly patients (≥65years old) who were admitted to the ED-ICU with a diagnosis of severe sepsis and/or septic shock were included. The demographic data, biochemistry data, qSOFA, and APACHE II score were compared between survivors and nonsurvivors.

A total of 117 patients was included with mean age 81.5±8.3years old. The mean APACHE II score was 21.9±7.1. In the multivariate Cox proportional hazards model, RDW level was an independent variable for mortality (hazard ratio: 1.18 [1.03-1.35] for each 1% increase in RDW, p=0.019), after adjusting for CCI, any diagnosed malignancy, and eGFR. The AUC of RDW in predicting mortality was 0.63 (95% confidence interval [CI]: 0.52-0.74, p=0.025). In subgroup analysis, for qSOFA <2, nonsurvivors had higher RDW levels than survivors (17.0±3.3 vs. 15.3±1.4%, p=0.044).

RDW was an independent predictor of in-Hospital mortality in elderly patients with sepsis. For qSOFA scores <2, higher RDW levels were associated with poor prognosis. RDW could be a potential parameter used alongside the clinical prediction rules [2)].

Hemoglobin-to-red cell distribution width ratio (HRR) has shown good prognostic value in various cancers. However, the relationship between HRR and outcomes in critically ill patients with traumatic brain injury (TBI) remains unclear. This study aimed to investigate the association between HRR and mortality among critically ill patients with TBI.

Methods: The Medical Information Mart for Intensive Care-IV (MIMIC-IV) database was utilized to conduct this retrospective cohort study. TBI patients were divided into four quartiles according to their HRR values. The primary outcome was 30-day mortality, whereas the secondary outcomes were 60-day and 120-day mortality. Univariable and multivariable Cox proportional risk models were performed to evaluate the hazard ratio (HR) and 95% confidence interval (CI) for the relationship between HRR and mortality. Receiver operating characteristic (ROC) curves were conducted to assess the prognostic value of HRR.

Results: For 30-day mortality, after adjustment for all potential covariates, the relationship remained significant with HRR treated as a continuous variable (HR, 95% CI: 0.87 [0.81, 0.92]; p < 0.001). In the fully adjusted model, the HR with 95% CI for the second, third, and fourth quartile groups were 0.67 (0.5, 0.9), 0.65 (0.46, 0.94), and 0.5 (0.32, 0.79), respectively, compared to the first quartile group. A similar relationship was also observed for 60-day mortality and 120-day mortality. HRR had a better predictive value than hemoglobin and red cell distribution width (RDW).

Conclusions: A lower level of HRR is significantly associated with higher all-cause mortality among critically ill patients with TBI [3)].

1)
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