

Abstract Type : Oral

Abstract Submission No. : OR-1047

THE PROGNOSTIC ROLE OF RED CELL DISTRIBUTION WIDTH IN PREDICTING MORTALITY AMONG CHRONIC KIDNEY DISEASE: A META-ANALYSIS STUDY

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Objectives: Red cell distribution width (RDW) is a measure of red blood cell size variation and heterogeneity. It is calculated from routine hematology examination and traditionally used to classify the anemia. Various reports demonstrated this measurement could be a strong independent predictor of morbidity and mortality in many diseases. Nevertheless, the role of RDW in prognosis of chronic kidney disease (CKD) is still inconclusive. Therefore, we did a study to evaluate the role of RDW in predicting all-cause and cardiovascular-related (CVD) mortality among CKD patients.

Methods: Major medical databases (EMBASE, PUBMED, Science Direct, Cochrane, Springer, Scopus, ProQuest, and Lilacs) were systematically searched for observational study published until February 2019 with predefined protocol and without language restriction regarding PRISMA guideline. The endpoints of this study were RDW prediction of all-cause mortality and CVD-related mortality. The analysis was performed in RevMan 5.3 (fixed and random-effects model through heterogeneity test) to provide pooled measures for Relative Risk (RR).

Results: Thirteen studies were enrolled comprising 135,285 patients. Higher RDW was indicated as independent predictors for all-cause mortality compared to lower RDW (RR=1.8, 95%CI [1.45–2.23], $I^2=93\%$), including 1-year (RR 2.5, 95%CI [1.54–4.2], $I^2=85\%$), 5-year (RR=1.6, 95%CI [1.37–1.9], $I^2=48\%$), and ≥ 5 -year mortality (RR=1.3, 95%CI [1.12–1.54], $I^2=52\%$). CVD-related mortality was associated with higher RDW in comparison with lower RDW (RR 1.7, 95%CI [1.46–1.95], $I^2=28\%$) including < 5 -year (RR=1.8, 95%CI [1.5–2.1], $I^2=0\%$) or ≥ 5 -year (RR=1.8, 95%CI [1.5–2.1], $I^2=73\%$). The association of higher RDW was also significant with all-cause mortality in dialysis-based subgroup (RR=1.6, 95%CI [1.32–1.95], $I^2=73\%$), involving hemodialysis (RR=1.5, 95%CI [1.2–1.88], $I^2=0\%$) and peritoneal dialysis (RR=2, 95%CI [1.2–3.3], $I^2=59\%$).

Conclusions: Higher RDW value was associated with the all-cause and CVD-related mortality among CKD patients. Therefore, the use of potential role of RDW should be emphasized since inexpensive and simple to obtain, even in limited-resource settings.