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Usefulness of serial measurement of the red blood cell distribution width to predict 28-day mortality in patients with trauma

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Abstract

Background: This is the first study to evaluate the association between the serially measured RDW values and clinical severity in patients surviving >24h after sustaining trauma. We evaluated the serial measurement and cut-off values of RDW to determine its significance as a prognostic marker of early mortality in patients with suspected severe trauma.

Methods: This study retrospectively analyzed prospective data of eligible adult patients who were admitted to the ED with suspected severe trauma. The RDW was determined on each day of hospitalization. The primary outcome was all-cause mortality within 28-days of ED admission.

Results: We included 305 patients who met our inclusion criteria. The multivariate Cox regression model demonstrated that higher RDW values on day 1 (hazard ratio [HR], 1.558; 95% confidence interval [CI], 1.09-2.227; $p=0.015$) and day 2 (HR, 1.549; 95% CI, 1.046-2.294; $p=0.029$) were strong independent predictors of short-term mortality among patients with suspected severe trauma. Considering the clinical course of severe trauma patients, the RDW is an important ancillary test for determining severity. Specifically, we found that RDW values >14.4% on day 1 (HR, 4.227; 95% CI: 1.672–10.942; $p<0.001$) and >14.7% on day 2 (HR, 6.041; 95% CI: 2.361–15.458; $p<0.001$) increased the hazard 28-day all-cause

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