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Prognostic value of the red blood cell distribution width-to-albumin ratio in scrub typhus-associated acute kidney injury

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Objectives : This study aimed to investigate the clinical significance of the ratio of red blood cell distribution width (RDW) to albumin ratio (RAR) in patients with scrub typhus complicated by acute kidney injury (AKI).
Methods : From 2009 to 2023, 650 patients were diagnosed with scrub typhus. Of these, we enrolled 636 patients who were followed up until renal recovery or for at least 3 months. We divided the patients into two groups (Non-AKI vs. AKI) based on the RIFLE criteria and compared clinical characteristics between the two groups.
Results : Of 636 patients, 147 patients had scrub typhus-associated AKI. The overall incidence of AKI was 23.1%; of which, 15.1%, 7.0%, and 1.0% of cases were classified as Risk, Injury, and Failure, respectively. Compared to patients in the Non-AKI group, patients in the AKI group were older (71 ± 11 vs. 62 ± 14 years, P<0.001), and had comorbidities such as hypertension (63.3% vs. 29.0%, P<0.001), diabetes (29.9% vs. 13.7%, P<0.001) and chronic kidney disease (10.9% vs. 1.0%, P<0.001). The AKI group had a significantly longer hospital stay (8.4 ± 5.6 vs 6.1 ± 2.8 days, P<0.001) and received intensive care unit admission (19.0% vs. 0.2%, P<0.001) more frequently. The patients in the AKI group had poorer renal function (40 ± 17 vs. 78 ± 20 mL/min/1.73m^2, P<0.001) on admission and had a higher total leukocyte count (9.43 × 10^3/ mL vs. 6.51 × 10^3/mL, P<0.001). The AKI group had a higher RAR (4.24 ± 0.87 vs. 3.58 ± 0.63, P<0.001). Furthermore, the RAR correlated with AKI severity (4.02 ± 0.79 vs 4.56 ± 0.84 vs 5.27 ± 0.75, P<0.05). In a multivariate logistic regression analysis for predicting AKI, age, presence of comorbidities, leukocytosis, and RAR were significant predictors for AKI.
Conclusions : The RAR is helpful to predict the development of scrub typhus-associated AKI.