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Prediction of RRT Restart after Cessation of CRRT: A Multicenter Study

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Objectives : The purpose of this study is to identify clinical characteristics and biomarkers influencing the restart of renal replacement therapy (RRT) after the cessation of continuous renal replacement therapy (CRRT) and to build a predictive model using these parameters.
Methods : This multicenter retrospective study includes 891 patients who were treated using CRRT from July 2012 to December 2020 in the intensive care unit (ICU) of 3 academic hospitals. The primary endpoint observed was the restart of RRT during hospitalization. Baseline characteristics were compared between the no restart and restart RRT groups. Using univariate analysis and logistic regression, a prospective index was developed, and receiver operator characteristic (ROC) curve analysis was performed to confirm the predictive power of the prognostic index.
Results : Restart of RRT was needed in 632 (71.2%) patients. Compared to patients who did not restart, patients in the restart RRT group demonstrated higher age, higher BMI, higher baseline serum creatinine (Cr), lower urine output, longer ICU admission, and more comorbid conditions (HTN, DM, HF, ischemic heart disease). In the multivariate analysis, five parameters demonstrated independent influence on restart of RRT: HTN, Cr, ICU admission duration, BMI, and mean blood pressure. The prognostic index, which was calculated from these variables, showed a satisfactory potential to predict the restart of RRT after discontinuation of CRRT. ROC analysis revealed an area under the curve of 0.738 (95% CI, 0.703-0.773, $p<0.001$).
Conclusions : We found that 5 of the 40 parameters observed in our study were independent risk factors for the restart of RRT during admission and we successfully developed a prognostic index based on these variables to predict the restart of RRT after discontinuation of CRRT.