Establishment of Acute Kidney Injury Model in Hospitalized Patients with Malignant Tumors

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Introduction

Acute renal injury (AKI) is a common complication in tumor patients with lowly remission rate and highly mortality. The purpose of this study is to establish a prediction model for the occurrence and progression of malignancy-related AKI, and provide reliable data to guide the clinical optimization of the management of malignancy-related AKI.

Methods and Materials

All patients with malignant tumors discharged from our hospital from January 1, 2019 to December 31, 2019 were included in combination with the inclusion and exclusion criteria. Patients with AKI stage2 and 3 were defined as critical AKI. Patients was used to randomly divided into modeling cohort and validation cohort. The risk factors related to AKI were statistically analyzed by the modeling cohort. According to the risk assessment model of logistic regression β and OR value corresponding to the value is assigned to score the risk factors, and the prediction scoring model of AKI and critical AKI is established. Finally, the area under the AUC curve and Hosmer-Lemeshow goodness of fit test are used to evaluate the effectiveness and reliability of the risk prediction model.

Results

1. Totally of 66012 patients were included in this study, including 52798 patients in the model modeling cohort and 13214 patients in the validation cohort. There was no significant difference in baseline information between the modeling queue and the validation queue.
2. In the modeling cohort, logistic regression analysis showed that the relevant risk factors of AKI were male, BMI < 18.5kg/m2, patients with hypertension, COPD, stroke, heart failure, emergency hospitalized patients, patients treated by surgery, chemotherapy, introduction treatment, users of nephrotoxic drugs Electrolyte disorder, abnormal liver function, serum creatinine (SCR) ≥ 115 μmol / L, uric acid (UA) ≥ 360 μmol / L, eGFR < 60 ml / min / 1.73m2, anemia, elevated leukocytes. The risk factors of critical AKI were: stroke, emergency hospitalized patients, users of nephrotoxic drugs, surgical treatment, chemotherapy, abnormal liver function, serum creatinine (SCR) ≥ 115 μmol / L, uric acid (UA) ≥ 480 μ Mol / L, eGFR < 60 ml / min / 1.73m2, anemia, hypoalbuminemia, leukocyte elevation, electrolyte disorder.
3. Combined with the risk assessment model β and OR value corresponding to the value is used to assign and score the risk factors, and the AUC value of AKI risk prediction model is 0.750; The prediction accuracy of the model was 92.09%.

Results

4. The AUC value of critical AKI prediction model was 0.834; The prediction accuracy of the model was 98.71%.The P values of Hosmer lemeshow test were 0.216 and 0.115, suggesting that the model fit well. The area under AUC curve of AKI model in validation cohort was 0.758; The area under AUC curve of critical AKI prediction model was 0.836; There was no significant difference in AKI and critical AKI prediction models between the modeling cohort and the validation cohort, and the P values were 0.389 and 0.895 respectively.

Figure 1. AUC for predicting AKI and severe AKI in training cohort

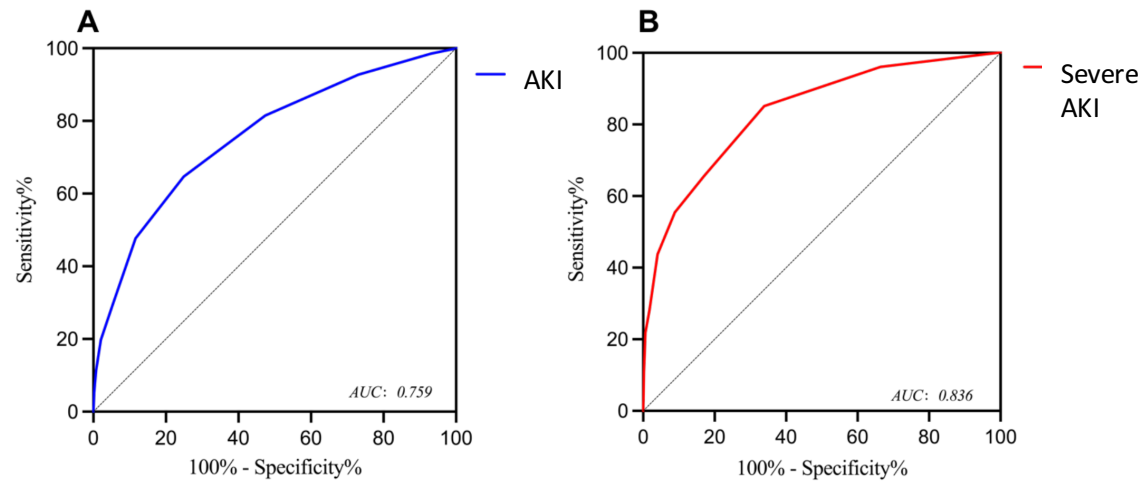

Figure 2. AUC for predicting AKI and severe AKI in testing cohort

Conclusions

This study established a universal risk scoring system for malignant tumors related AKI and critical AKI, which is used for early prediction of the occurrence and development of AKI in the clinic and guiding clinical intervention in the intervention factors, so as to reduce the incidence rate of AKI.

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