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Prognostic impact of APACHE II in the prediction of long term patient survival in the elderly acute kidney injury patients who underwent continuous renal replacement therapy

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Objectives : Prediction of long term patient survival in the elderly acute kidney injury (AKI) patients before commencement of continuous renal replacement therapy (CRRT) would be helpful in decision making. Acute Physiology and Chronic Health Evaluation II (APACHE II) scoring system is known to be useful in predicting patient's survival admitted to intensive care unit (ICU). However, it is unknown if it could predict long term patient's mortality rate. In this study we aimed to evaluate if APACHE II score can predict long term patients mortality among elderly AKI survivors who underwent CRRT in the ICU.

Methods : This is a single center, retrospective study of elderly AKI patients who underwent CRRT from January 2011 to December 2015. Baseline patient characteristics were checked by medical chart review and APACHE II score at the time of CRRT initiation was calculated. The 180-days of patient survival were verified by individual phone call. Multivariable analyses were performed to find out if the APACHE II score could predict long term patient survival rate. We evaluated the receiver operating characteristics (ROC) curve to find out cutoff value that predicts patient long term mortality.

Results : A total of 205 survivors were included in this study. The mean patient's age was 79.79 ± 3.77 years old and 51.4% of the patients were male. Their mean APACHE II score at the time of CRRT initiation was 26.55 ± 7.26 . After 180 days of hospital discharge, only 21.9% (45/205) of the patients were survived. The survivor's APACHE score was 22.25 ± 6.84 which was significantly lower than that of the non-survivors' (27.70 ± 7.00 , $p < 0.001$). When we tested multivariable analysis, high APACHE II score (HR 1.027 (1.003–1.051), $p = 0.024$) was predictive of long term patients mortality rate along with low serum albumin level (HR 0.599 (0.392–0.914), $p = 0.017$). Survival rate was significantly different between patients with APACHE II score ≤ 22 and APACHE II score > 22 ($p < 0.001$). The AUC of APACHE II for 180 day mortality was 0.713 (0.643–0.776, $p < 0.001$).

Conclusions : APACHE II score higher than 22 were predictive for the long term

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mortality rate in the elderly AKI patients underwent CRRT. This could be a useful guide in making decision for elderly AKI patients who need CRRT in the ICU. Further validation study will be needed.

Keywords : AKI, Elderly, CRRT, APACHE