

# Impact of Acute Kidney Disease on the Incidence of Acute Kidney Injury and Patient Outcome in the Intensive Care Unit



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## Introduction

Acute kidney disease (AKD) is a kidney dysfunction sustained more than seven days and less than 90 days, and chronic kidney disease (CKD) is a kidney dysfunction sustained more than 90 days. CKD is a traditional risk factor for incident acute kidney injury (AKI) at intensive care unit (ICU) whereas the influence of AKD had not been fully studied.

## Methods and Materials

This is a multi-center retrospective cohort study of critically ill patients admitted to ICU at the 3<sup>rd</sup> affiliated hospitals from January 2011 to December 2020. Patients without serum creatinine data before hospital admission or end-stage kidney disease were excluded. We divided patients into three groups based on the kidney health status within 1 year of hospital admission; no kidney disease (NKD), AKD, and CKD. AKI was defined as KDIGO serum creatinine criteria. The influence of baseline AKD on the incidence of AKI at ICU and in-hospital mortality rate was analyzed by cox-proportional hazard model.

## Results II

The population was all Asian, median age of 67 (18-110) years, and 57.6% were male. In all, AKI was observed in 2461(34.4%) patients. Referenced by NKD, AKD had 2.354(1.996-2.776) fold higher risk of incident AKI, similar as seen in CKD (HR 2.347(2.028-2.716)) (Fig 2). During the median of 16(9, 23) days of hospital stay, 819(11.4%) died in hospital. In patients without AKI, AKD was risk for in-hospital mortality (HR 2.176(1.625-2.915)) reference by NKD. In patients with AKI, AKD and NKD had similar impact whereas CKD (HR 0.754 (0.593-0.960)) was protective (Fig 3).

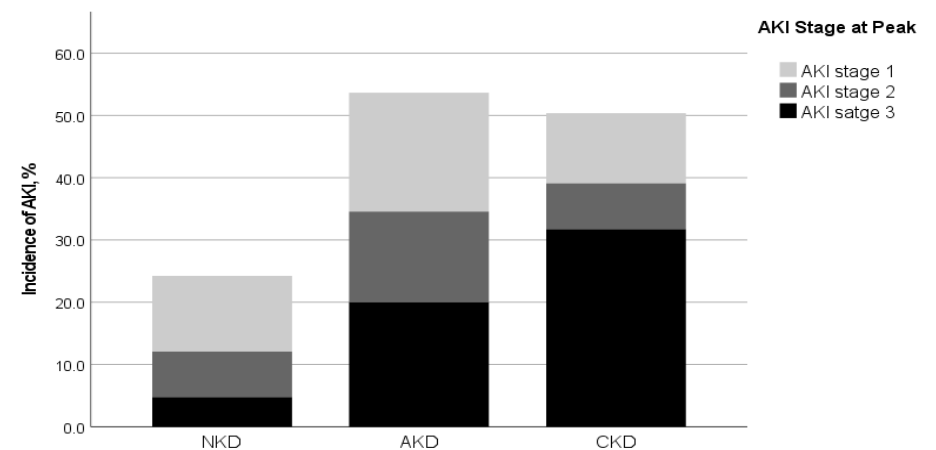


Figure 2. Incidence of AKI in ICU by baseline kidney function status

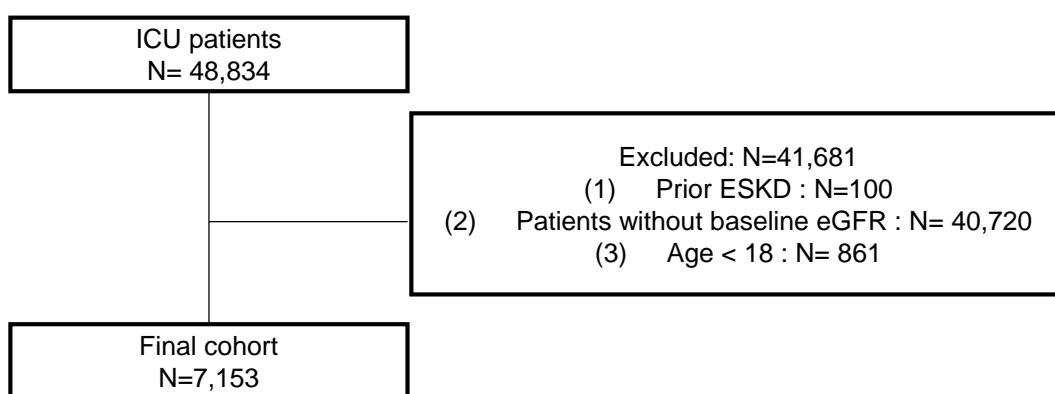


Figure 1. Diagram of the included patients

## Results I

During the study period, 48,834 were admitted to ICU and a total of 7,153 (14.6%) were eligible for analyses. In 7,153 included patients, baseline NKD, AKD, and CKD were seen in 4,792 (66.6%), 926(12.9%), and 1,465(20.5%), respectively (Fig. 1).

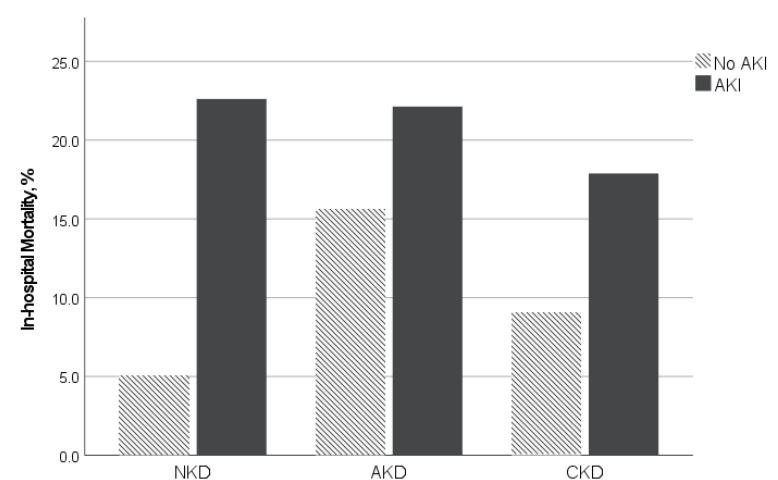


Figure 3. In hospital mortality by baseline kidney function status and incident AKI

## Conclusions

AKD was observed in 12.9% of ICU admitted patients, and it was associated with higher risk for incident AKI and in-hospital mortality. This study implies the significance of recognizing AKD in the management of ICU patients.

