Impact of chronic kidney disease on in-hospital outcomes in patients with acute myocardial infarction: Insights from the J-MINETU study

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BACKGROUND

Patients with chronic kidney disease (CKD) have a higher risk of cardiovascular disease than those without it. Limited studies, however, have addressed an impact of CKD on clinical outcomes in a large cohort of patients with acute myocardial infarction (AMI) defined as elevated cardiac troponin.

METHODS

A total of 3,281 patients presenting with AMI were enrolled in the J-MINETU study, which is a prospective, multicenter registry in Japan (UMIN000010037). AMI was diagnosed based on the latest universal definition. CKD stage on admission was classified into 3 groups (stages 1 or 2, eGFR ≥60mL/min/1.73m2; stage 3, 60>eGFR<30mL/min/1.73m2; and stages 4 or 5, eGFR<30mL/min/1.73m2). We assessed odds ratio (OR) of CKD stages having in-hospital mortality. Major adverse cardiac event (MACE) defined as a composite of all-cause death, cardiac failure, fatal arrhythmia and major bleeding during hospitalization. To assess the performance of CKD stages in predicting in-hospital mortality or MACE, C-index and net reclassification improvement (NRI) were also calculated.

RESULTS

Median age was 69 (61-78) years and 75.2% of patients were male. Of the 3,281 patients, 1,878 had CKD stages 1 or 2, 1,073 had CKD stage 3 and the remaining 330 had CKD stages 4 or 5. While in-hospital mortality significantly increased from 2.0% in CKD stages 1 or 2 through 4.8% in CKD stage 3 to 39.5% in CKD stages 4 or 5 (<p=0.0001). Crude and adjusted OR for in-hospital mortality were 3.73 (3.05-4.57) and 1.67 (1.29-2.18) in CKD stage 3, and 5.98 (4.56-7.82) and 2.82 (1.94-4.02) in CKD stage 4 or 5 as compared to CKD stages 1 or 2. Crude and adjusted OR for in-hospital MACE were 3.73 (3.05-4.57) and 1.67 (1.29-2.18) in CKD stage 3, and 5.98 (4.56-7.82) and 2.82 (1.94-4.02) in CKD stage 4 or 5 as compared to CKD stages 1 or 2. C-index of basic model was 0.877 (0.849-0.904) and significantly gained up to 0.890 (0.862-0.919) when adding CKD stage to this model. Similarly, in-hospital mortality (p=0.04; NRI 0.627, <p=0.0001). Similarly, C-index of basic model was 0.820 (0.798-0.842) and significantly gained up to 0.830 (0.808-0.851) when adding CKD stage to this model in predicting in-hospital MACE (p=0.001; NRI 0.306, <p=0.0001).

CONCLUSIONS

Our results indicated that the presence of CKD was independently associated with in-hospital mortality and MACE in patients with AMI. Evaluation of CKD stage would be useful to predict in-hospital mortality and MACE in AMI.

Acute Myocardial Infarction

Acute coronary syndromes, Acute myocardial infarction, Chronic kidney disease