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Trends of acute kidney injury following percutaneous coronary interventions

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Topic(s):
Acute Coronary Syndromes: Treatment, Revascularization

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Introduction: Acute kidney injury (AKI) is a significant in-hospital complication in patients undergoing percutaneous coronary interventions (PCI) and has been shown to be associated with poor outcomes. Prior studies have shown an upward trend of AKI post PCI which may be related to a multitude of factors. In this study, we aim to discern whether the recent changes in AKI definition, awareness of risk calculators, and preventive measures have been effective in changing the inclining trend.

Methods: Patients who underwent PCI during hospitalization were identified retrospectively in the Nationwide Readmission Database (NRD) from January 2010 to December 2014. All patients older than 18 years were included in the current study. Patient demographics and comorbidities were identified using appropriate ICD-9 codes. The primary outcome is the temporal trends of AKI following PCI and secondary outcomes are temporal trends in mortality, length of stay and hospitalization cost in patients with AKI. Continuous variables were expressed as means ± standard deviation or median (IQR), and categorical variables were expressed as percentages (%). All statistical tests were two-sided.

Results: Among the 2,712,473 patients who underwent PCI from 2010 to 2014, 162,286 (6%) patients developed AKI post PCI. Mean age was 69.22±12.34 years and 65% of them were males. The percentage of cases with AKI rose almost twofold from 2010 to 2014 (4.8% to 8.1%, p-value <0.005), despite the lack of a significant change in patient's demographics and comorbidities over the years. Among patients with a history of Chronic Kidney Disease (CKD) the incidence of AKI increased from 20.3% to 24.2%, and in patients without CKD history the incidence of AKI almost doubled (2.6% to 5.0%) from 2010 to 2014. There was a slight decrease in in-hospital mortality (9.4% to 8.8%) and median length of stay (7 days to 5 days), and a slight increase in the mean cost of hospitalization ($124,755.1 to $133,902.17) from 2010 to 2014.

Conclusion: This large cohort study shows a consistent uptrend of AKI in patients undergoing PCI from 2010 to 2014. Despite this, the mortality and length of stay are decreasing while the cost of hospitalization only slightly increased in patients with AKI. Thus, future drives to implement renal protective measures and advanced studies to identify new preventive therapies are needed to reduce the incidence of AKI post-PCI.
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AKI Incidence and mortality trend