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9-1-2022

TCT-545 Angiographic Features, Lesion, and Procedural Characteristics in Patients With Chronic Kidney Disease Undergoing Protected High-Risk Percutaneous Coronary Intervention

Aditya Bharadwaj

Yanru Li

Jeffrey Moses

Bjorn Redfors

Arsalan Abu-Much

See next page for additional authors

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Authors

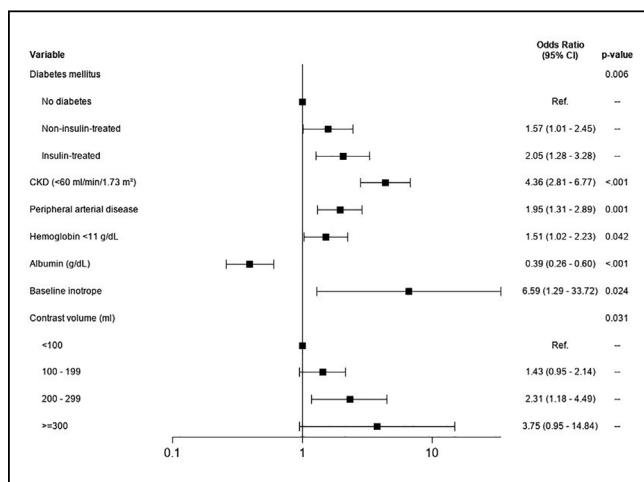
Aditya Bharadwaj, Yanru Li, Jeffrey Moses, Bjorn Redfors, Arsalan Abu-Much, Peter Mallow, Mitul Patel, Cindy Grines, Haroon Faraz, Robert Yeh, Thomas Waggoner, Duane Pinto, Wayne Batchelor, Alexander Truesdell, William O'Neill, Mir B. Basir, and Suzanne Baron

York, USA; ⁶Icahn School of Medicine at Mount Sinai, Brooklyn, New York, USA; ⁷Icahn School of Medicine, New York, New York, USA; ⁸Icahn School of Medicine at Mount Sinai, New York, New York, USA; ⁹Mount Sinai Hospital, New York, New York, USA; ¹⁰Mount Sinai Heart Health System, New York, New York, USA; ¹¹Icahn School of Medicine, Mount Sinai Medical Center, New York, New York, USA; and the ¹²The Mount Sinai Medical Center, Scarsdale, New York, USA

BACKGROUND Development of acute kidney injury (AKI) after transcatheter aortic valve replacement (TAVR) portends a poor long-term prognosis. We sought to evaluate real-world predictors of AKI after TAVR in a large-volume tertiary structural heart center.

METHODS Consecutive patients undergoing TAVR at a large tertiary care center between January 1, 2017, and December 31, 2020, with available creatinine measurements, were included. A total of 1,335 patients were included. The primary endpoint of the study was the development of AKI, which was defined as an increase in serum creatinine by at least 50% or at least 0.3 mg/dL within 48 hours after TAVR. Independent predictors of AKI were derived from multivariate logistic regression analysis.

RESULTS A total of 158 (13.4%) patients developed AKI post-TAVR and tended to have greater comorbidities and a higher burden of coronary artery disease, including prior revascularization (all, $P < 0.01$). Insulin-dependent diabetes, peripheral artery disease, baseline chronic kidney disease (estimated glomerular filtration rate < 60), anemia, and hypoalbuminemia were all independent clinical predictors of AKI (Figure 1). A step-wise increase in the risk of AKI was also observed with increasing contrast volume and requiring intraprocedural inotropes.



CONCLUSION Significant AKI was observed in 1 in 10 patients after TAVR. Both clinical and procedural risk predictors increased the risk of AKI after TAVR. Whether optimizing management of the clinical risk predictors and implementation of periprocedural strategies to mitigate contrast volume can reduce the incidence of AKI post-TAVR warrant further study.

CATEGORIES OTHER: Renal Insufficiency and Contrast Nephropathy

TCT-544

Predictors of Acute Kidney Injury in Patients With ST-Segment Elevation Myocardial Infarction Treated With Primary Percutaneous Coronary Intervention in the Contemporary Era

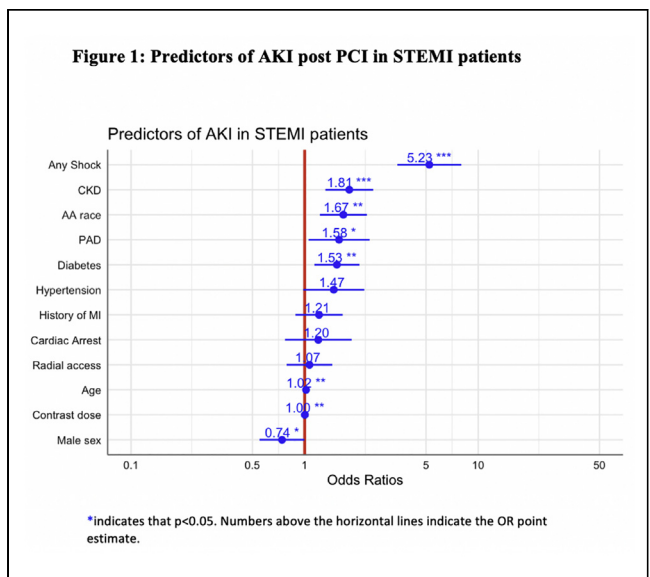


Raunak Nair,¹ Anirudh Kumar,² Chetan Huded,³ Michael Johnson,⁴ Grant Reed,¹ Amar Krishnaswamy,¹ A. Michael Lincoff,¹ Samir Kapadia,⁵ Cleveland Clinic, Cleveland, Ohio, USA; ²Cleveland Clinic Foundation, Cleveland, Ohio, USA; ³Saint Luke's Mid America Heart Institute, Leawood, Kansas, USA; ⁴University Hospital, Augusta, Georgia, USA; and the ⁵Cleveland Clinic, Orange, Ohio, USA

BACKGROUND Our study aimed to assess the predictors of acute kidney injury (AKI) after percutaneous coronary intervention (PCI) in patients with ST-segment elevation myocardial infarction (STEMI) who were admitted to our hospital over the last decade.

METHODS All STEMI patients who underwent PCI at the Cleveland Clinic main campus between January 1, 2011, and July 15, 2019, were included in our study. Patients were categorized into 2 groups depending on a diagnosis of the presence or absence of AKI post-PCI. AKI was defined as a > 0.3 mg/dL rise in post-PCI creatinine from preprocedure value. Multivariable logistic regression was used to analyze the predictors of AKI post-PCI.

RESULTS Overall, 1,847 patients were admitted to our hospital with a STEMI and underwent PCI during the study period. Of these, 267 (15%) developed AKI post-PCI. Patients who developed AKI were older (median age 66 years vs 61 years; $P < 0.001$), more likely to be female (43% vs 31%; $P < 0.001$), and be of African-American (AA) race (34% vs 25%; $P < 0.001$). Multivariable regression analysis revealed that presence of shock, underlying chronic kidney disease (CKD), diabetes, female sex, and AA race were independently associated with higher odds of developing AKI post-PCI (Figure 1). After adjusting for other variables, contrast dose was not associated with higher odds of developing AKI (OR: 1; 95% CI: 1-1.005).



CONCLUSION Baseline characteristics rather than contrast dose appear to be the main predictors of AKI in STEMI patients who undergo PCI. Aggressive optimization of preprocedural characteristics is warranted to improve the outcomes of this high-risk group.

CATEGORIES OTHER: Renal Insufficiency and Contrast Nephropathy

TCT-545

Angiographic Features, Lesion, and Procedural Characteristics in Patients With Chronic Kidney Disease Undergoing Protected High-Risk Percutaneous Coronary Intervention



Aditya Bharadwaj,¹ Yanru Li,² Jeffrey Moses,³ Bjorn Redfors,⁴ Arsalan Abu-Much,⁵ Peter Mallow,⁶ Mitul Patel,⁷ Cindy Grines,⁸ Haroon Faraz,⁹ Robert Yeh,¹⁰ Thomas Waggoner,¹¹ Duane Pinto,¹⁰ Wayne Batchelor,¹² Alexander Truesdell,¹³ William O'Neill,¹⁴ Mir Basir,¹⁴ Suzanne Baron¹⁵
¹Loma Linda University, Loma Linda, California, USA; ²Cardiovascular Research Foundation, New York, New York, USA; ³St. Francis Hospital & Heart Center, Roslyn, New York, USA; ⁴CRF, New York, New York, USA; ⁵Chaim Sheba Medical Center, Ramat Gan, Israel; ⁶Xavier University, Cincinnati, Ohio, USA; ⁷UC San Diego Health System, La Jolla, California, USA; ⁸Northside Hospital, Atlanta, Georgia, USA; ⁹Hackensack University Medical Center, Hoboken, New Jersey, USA; ¹⁰Beth Israel Deaconess Medical Center, Boston, Massachusetts, USA; ¹¹Pima Heart & Vascular/Tucson Medical Center, Tucson, Arizona, USA; ¹²Inova Heart and Vascular Institute, Falls Church, Virginia, USA; ¹³Virginia Heart /Inova Heart and Vascular Institute, McLean, Virginia, USA; ¹⁴Henry Ford Hospital, Detroit, Michigan, USA; and the ¹⁵Lahey Hospital & Medical Center, Winchester, Massachusetts, USA

BACKGROUND Patients with chronic kidney disease (CKD) are at risk for accelerated atherosclerosis. There is a paucity of data regarding coronary lesion characteristics and procedural details of CKD patients, especially those on dialysis, undergoing high-risk percutaneous coronary intervention (HRPCI) with left ventricular support.

METHODS We analyzed patients from the PROTECT III study who underwent Impella-supported HRPCI, stratified into 3 groups according to kidney function status based on history: 1) normal kidney function; 2) CKD not on dialysis; and 3) CKD on dialysis. Baseline characteristics, angiographic features, and procedural details were assessed.

RESULTS The study population included 3,702 treated lesions in 1,223 patients with a mean age of 71 ± 11 years; 73% (893) were male, 68% (834) had normal kidney function (serum creatinine = 1 mg/dL [IQR: 0.9-1.2]), 23% (278) had CKD not on dialysis (serum creatinine = 1.6 mg/dL [IQR: 1.3-1.9]), and 9% (111) were on dialysis. Patients on dialysis were significantly younger and had more comorbidities, as well as a greater incidence of acute myocardial infarction as an indication for HRPCI compared with the other 2 groups (45.0 [dialysis] vs 30.1 [CKD not on dialysis] vs 36.0 [normal kidney function]; *P* = 0.03). There was no difference between groups in prevalence of 3-vessel disease (*P* = 0.63). Patients on dialysis had greater prevalence of severely calcified lesions and higher use of rotational and orbital atherectomy with greater number of passes (Table 1). Despite this, no significant differences were observed in post-PCI Thrombolysis In Myocardial Infarction flow, incidence of no-reflow, or dissection/perforation.

	Normal Kidney Function (n = 834)	CKD Not on Dialysis (n = 278)	CKD on Dialysis (n = 111)	P Value
Left main disease	480/820 (58.1)	162/276 (58.7)	70/111 (63.1)	0.61
Severe calcification	837/1,887 (44.4)	(804/603) (50.4)	(141/249) (56.6)	0.0002
Atherectomy	306/550 (55.6)	123/203 (60.6)	56/83 (67.5)	0.09
No. of passes	7.1 ± 15.7	3.8 ± 2.4	12.3 ± 14.4	0.61
Post-TIMI flow 3	(98.5)	(99.0)	(98.8)	0.74
No reflow	(0.7)	(0.5)	0	0.49
Abrupt closure	(1.2)	0	(0.8)	0.009
Perforation	(0.8)	(0.8)	(0.0)	0.46

Values are mean ± SD, (%), or n/N where applicable.
TIMI = Thrombolysis In Myocardial Infarction.

CONCLUSION In contrast to patients with normal kidney function, patients with CKD with or without dialysis treated with Impella had more comorbidities, higher prevalence of severely calcified lesions, and greater use of atherectomy with more passes. Despite the complexity of PCI, no significant differences in complications were observed.

CATEGORIES CORONARY: Complex and Higher Risk Procedures for Indicated Patients (CHIP)

TCT-546

Stroke and Safety Outcomes With Left Atrial Appendage Occlusion Device Implantation in Chronic Kidney Disease: A Systemic Review and Meta-Analysis



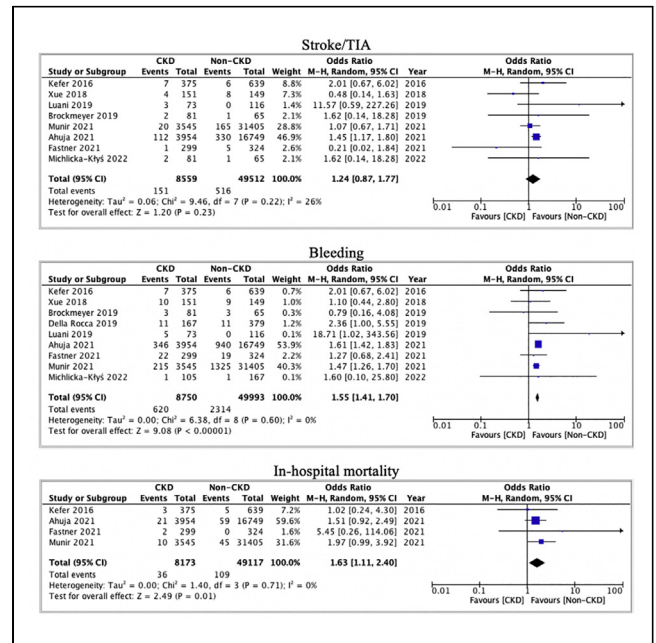
Gauravpal Singh Gill,¹ Shikha Shailly,² Pramod Kumar Ponna,³ Arun Kanmanthareddy,¹ Venkata M. Alla⁴
¹Creighton University School of Medicine, Omaha, Nebraska, USA;
²University of Nebraska Medical Center, Omaha, Nebraska, USA;
³Louisiana State University Shreveport, Shreveport, Louisiana, USA;
 and the ⁴Creighton University Medical Center, Omaha, Nebraska, USA

BACKGROUND Chronic kidney disease (CKD) is associated with an increased risk of thrombotic and bleeding events, including stroke, and periprocedural and gastrointestinal bleeding especially among patients with atrial fibrillation on anticoagulation. Recent studies investigating outcomes with left atrial appendage occlusion (LAAO) in this population have shown contradictory results.

METHODS PubMed and Google Scholar databases were queried for studies comparing outcomes among patients with and without CKD who underwent LAAO device implantation. Data on outcomes from the selected studies were extracted and analyzed using random effects model. Heterogeneity was assessed using the I² test.

RESULTS Data from 11 studies with 78,257 patients were included in the final analysis. There was no difference in the risk of ischemic stroke or transient ischemic event (OR: 1.24; 95% CI: [0.87-1.77];

P = 0.23) during the follow-up period. Patients with CKD were associated with a higher risk of bleeding (OR: 1.55; 95% CI: 1.41-1.70; *P* < 0.01) and in-hospital mortality (OR: 1.63; 95% CI: 1.11-2.40; *P* = 0.01) with LAAO device implantation. There was no difference in risk of significant pericardial effusion (OR: 1.17; 95% CI: 0.86-1.57; *P* = 0.32), vascular complications (OR: 1.18; 95% CI: 0.92-1.51; *P* = 0.18), or device-related thrombus (OR: 1.13; 95% CI: 0.53-2.40; *P* = 0.75) between the 2 groups.



CONCLUSION This study shows an association between CKD and increased risk of bleeding events, and in-hospital mortality among patients undergoing LAAO device implantation. There was no difference between ischemic stroke or other periprocedural complications. Due to a delicate balance between increased risks of thrombotic and bleeding events in this population, future studies comparing outcomes with LAAO and anticoagulation are warranted in CKD patients.

CATEGORIES STRUCTURAL: Left Atrial Appendage Exclusion

TCT-547

In-Hospital Outcomes of TAVR in Patients With Chronic Kidney Disease: A Nationwide Database Study



Marta Lorente-Ros,¹ Subrat Das,² Lingling Wu,² Francisco Romeo,² Jose Aguilar-Gallardo,² Amisha Patel²
¹Icahn School of Medicine at Mount Sinai, New York, New York, USA;
²Mount Sinai Morningside, Icahn School of Medicine at Mount Sinai, New York, New York, USA

BACKGROUND Chronic kidney disease (CKD) and end-stage renal disease (ESRD) have been associated with worse outcomes after transcatheter aortic valve replacement (TAVR). With TAVR indications extending to a wider range of patient populations, the implications of CKD and ESRD on outcomes are of increasing relevance and not well described. We aimed to determine the association between CKD and ESRD and in-hospital outcomes after TAVR.

METHODS We queried the National Inpatient Sample database for TAVR performed between 2016 and 2018 using International Classification of Diseases-Tenth Revision codes. We compared in-hospital outcomes between 3 groups: normal renal function, CKD, and ESRD.

RESULTS A total of 136,025 patients underwent TAVR in the study period (mean age 79.7 ± 0.1 years; 46.0% female); 64.4% of the patients had normal renal function, 32.0% had CKD, and 3.6% had ESRD. Patients with CKD or ESRD had a higher prevalence of prior