Transcatheter edge to edge mitral valve repair in patients with end-stage renal disease on dialysis: an analysis from the United States Renal Data System

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Brief research report

End-stage renal disease requiring dialysis (ESRD) is considered a significant adverse prognosticator for patients undergoing transcatheter edge to edge mitral valve repair (TEER) (1,2). ESRD patients have a high-risk clinical profile, and adverse anatomic features such as mitral calcification are not optimal for TEER (1,3). Seminal TEER trials such as MITRA-FR and COAPT did not have any patients with ESRD (4,5). The United States renal data system database (USRDS) provides a unique opportunity to examine the in-hospital, 30-day and 1-year outcomes for all-cause mortality and all-cause readmission (4). Here, we report the in-hospital and 1-year outcomes in this patient population.

We performed a retrospective analysis of the USRDS from 2013 till 2018 and identified patients 18 years or older who had ESRD and underwent TEER (6). This study is exempt from the human subjects committee review. Outcomes assessed were in-patient mortality, 30-day all-cause mortality, 30-day all-cause readmission, 1-year all-cause mortality, and 1-year all-cause readmission rates. In this largest study to date in ESRD patients undergoing TEER, we identified 463 patients with mean age of 69.3±11.0 years, 58.1% were male and 67.2% were white. There was a high prevalence of comorbidities such as hypertension (90.0%), followed by atherosclerotic heart disease (74.5%), diabetes mellitus (44.1%), heart failure (39.3%), and peripheral vascular disease (19.0%).

Table 1 In-hospital, 30-day, and 1-year TEER outcomes in ESRD

Procedural outcomes	ESRD (%)
In-hospital mortality (2011–2018)*	14 (3.0)
30-day all-cause mortality (2011–2018)*	23 (5.0)
30-day all-cause readmission (2011–2018)*	119 (25.7)
1-year all-cause mortality (2011–2017)^	104 (33.5)
1-year all-cause readmission (2011–2017)^	243 (78.4)

*, indicates outcomes among the ESRD patients undergoing TEER from 2011 to 2018, N (total) =463; ^, indicates outcomes among the ESRD patients undergoing TEER from 2011 to 2017, N (total) =310. TEER, transcatheter edge to edge mitral valve repair; ESRD, end-stage renal disease requiring dialysis.

We found an in-hospital mortality of 3.0%, a 30-day mortality of 5.0%, and a high 1-year all-cause mortality of 33.5%. The all-cause 30-day readmissions rate was 25.7%, and the 1-year readmissions rate was 78.4% (*Table 1* and *Figure 1*). The outcomes were similar in the early part of the national experience versus later part (2013–2015 and 2016–2018) even though more procedures were performed in the later period (378 *vs.* 85).

The 3% in-hospital mortality in ESRD patients is significantly higher than the previously reported in-hospital mortality (1.8% or less) in standard risk non-ESRD patients (7). This likely reflects the adverse anatomic and

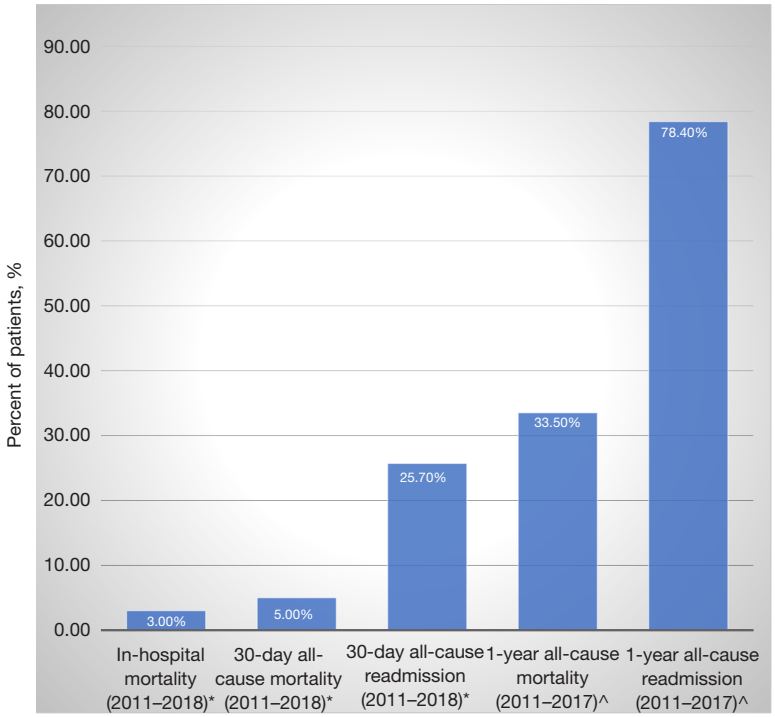

Figure 1 In-hospital, 30-day and 1-year TEER outcomes in ESRD. *, indicates outcomes among the ESRD patients undergoing TEER from 2011 to 2018, N (total) =463; ^, indicates outcomes among the ESRD patients undergoing TEER from 2011 to 2017, N (total) =310. TEER, transcatheter edge to edge mitral valve repair; ESRD, end-stage renal disease requiring dialysis.

clinical profile of ESRD patients. However, our findings reflect a lower mortality than previously reported in ESRD patients from the Society of the Thoracic Surgeon/American College of Cardiology National Cardiovascular Data Registry Transcatheter Valve Therapy registry (2). In this study with 154 ESRD patients, their inpatient and 30-day mortality were 6.5% and 13.5%. This discrepancy may be due to the larger number of patients in our study being more representative of true outcomes. The 1-year mortality in that study at 32.3% was similar to our study and this likely reflects the high overall mortality in ESRD patients due to underlying comorbidities and not necessarily mitral valve related outcomes.

In summary, in this nationwide study of TEER in ESRD, we found that the in-hospital and 30-day mortality rates, while higher than in non-ESRD patients, are lower than previously reported. However, 1-year mortality remains high compared to non-ESRD patients though considering the overt high-risk patient profile, the absolute risks are still reasonable considering their comorbidities. The limitation of the study is the lack of data on anatomic and procedural details and the inability to identify patients who declined TEER due to anatomic constraints.

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Footnote

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://atm.amegroups.com/article/view/10.21037/atm-22-4063/coif). The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical

standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Publication of this data has been approved by the ethics committee/institutional review board and USRDS, and individual consent for this retrospective analysis was waived.

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