odds ratios (ORs) and mean differences (MDs) with their 95% confidence intervals (CIs) for dichotomous and continuous data, respectively, using a random-effects model.

We identified 4 RCTs[3–6] included 7,168 patients (mean age 66.3 ± 11.0 years, 37.1% were females, and 46.5% were non-Caucasians) with a mean follow up of 14.5 ± 5.0 months. Only one trial was exclusively in heart failure patients without diabetes,[3] and the other 3 RCTs included patients with and without diabetes, for which we extracted data from the nondiabetics patients.[4,5,6] The mean left ventricular ejection fraction (LVEF) was 30% ± 6.8% (83.5% with ischemic cardiomyopathy) and the mean eGFR was 66 ± 20 ml/min/1.73 m^2. Compared with the placebo group, SGLT2i was associated with a significant reduction of the primary composite outcome (OR = 0.71; 95% CI = 0.63 to 0.81; p <0.01) and a significant improvement in the KCCQ (MD = 5.37; 95% CI = 0.73 to 10.0; p = 0.02; **Figure 1**).

In this study of patients with heart failure without diabetes, we found that SGLT2i was associated with a significant reduction of cardiovascular mortality and heart failure hospitalization. In addition, SGLT2i was associated with a significant improvement in QoL as measured by the KCCQ.

In patients with diabetes mellitus and heart failure, SGLT2i was associated with a decreased risk of clinically relevant cardiovascular death, heart failure hospitalization, and heart failure symptoms.[2] In our investigation, we found that SGLT2i administered to non-diabetic heart failure is associated improved clinical outcomes. These findings suggest that the benefits of SGLT2i are independent of glucose lowering effects. Although the beneficial effects of SGLT2i were thought to be due to its diuretic effects, recent trials showed favorable effects on myocardial remodeling.[3]

Limitations of this study are mainly due to small sample size, relatively short follow-up duration, and limited trials of exclusively heart failure patients without diabetes. Further larger RCTs with long-term follow-up are needed.

In conclusion, among heart failure patients without diabetes, SGLT2i was associated with a significant reduction of cardiovascular mortality and heart failure hospitalization as well as improvements in QoL.

Disclosures

The authors report no competing interests.

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Meta-Analysis of Outcomes in Ultrasound Guided Versus Traditional Guided Vascular Access for Interventional Cardiac and Peripheral Vascular Procedures

Every year, it is estimated that over 1 million cardiac catheterization procedures are performed in the United States.[1] Traditionally, vascular access for cardiac catheterization procedures was obtained by femoral artery puncture; however, radial artery access has been associated with reduced access site and bleeding complications.[2] Over the last decade, there has been an increased utilization of Point of Care ultrasound and its incorporation into medical education and daily practice. Whether the routine use of ultrasound to guide vascular access is efficacious and reduces complications is unknown. To address these concerns, multiple randomized controlled trials have been conducted to evaluate the benefits of utilizing point of care ultrasound on time quality metrics and rates of vascular access complications, and have yielded variable results.[3-12] To enhance the power for assessing the effect of

ultrasound on vascular access outcomes, we conducted a meta-analysis of trials examining the use of ultrasound guided vascular access compared with traditional techniques in adults who underwent diagnostic or interventional cardiac procedures via the femoral or radial artery.

We performed a systematic search of databases including PubMed, Medline, CENTRAL, and ClinicalTrials.gov from inception till February 2021 in accordance with the Preferred Reporting Items for Systematic review and Meta-Analyses guidelines. We included patients from randomized trials that used ultrasound to guide femoral or radial artery access compared with matched controls in patients who underwent diagnostic or therapeutic cardiac or other vascular procedures. The primary outcome of our meta-analysis was time to first successful vascular access, while secondary efficacy end points were odds of first pass success, odds of venipuncture, and significant hematoma development. Outcomes were analyzed as dichotomous variables, and odds ratios (OR) and their respective 95% confidence intervals (CI) were obtained using the Mantel-Haenszel method and a random-effects model was used. Continuous variables were reported as mean ± standard deviation (SD) and the mean difference (MD) along with their respective 95% CI's were obtained. A two-tailed p-value <0.05 was used to indicate significance. Review Manager version 5.3 (RevMan; Cochrane Collaboration) was used to analyze all study data.

A total of 10 published RCTs,[3-12] including a total of 5,397 patients were included in this meta-analysis (2,679 patients who underwent ultrasound guided access and 2,718 patients who underwent palpation or fluoroscopy guided vascular access). The mean age of study participants was 63.9± 12.1 years, 35.7% had diabetes mellitus, and 65.9% of participants were men. Follow up duration ranged from several hours post-procedure up to 30 days. Nine trials reported data on time to successful vascular access.[3-11] Overall, there was a statistically significant decrease in the time to successful vascular access (MD: -17.01 sec [95% CI, -27.25, −6.77]; p = 0.001, I^2=75%) (Figure 1) in patients randomized to ultrasound guided access compared with control. However, stratification by artery accessed showed a significant reduction in time to successful access among patients who underwent ultrasound guided femoral puncture (MD: -22.08 sec [95% CI, -34.50, −9.67]; p = 0.0005); meanwhile, no significant reduction was observed in those who underwent radial puncture (MD: -7.67 sec [95% CI, -27.86, 12.52]; p = 0.46).

A total of 9 RCTs reported on the number of first pass success using ultrasound compared with control.[3-4,8-11] The odds of first pass success was 2.55 times higher in the group who underwent ultrasound-guided access compared with those who underwent palpation or fluoroscopy guided vascular access (OR: 2.55 [95% CI, 1.85 to 3.50]; P<0.0001, I^2=83%) (Figure 1). The odds of hematoma development were reduced by 48% with ultrasound-guided access compared with control (1.1% vs. 2.3%, respectively; OR: 0.52 [95% CI, 0.28 to 0.97]; p = 0.04, I^2=29%), Figure 1. Ultrasound guided access was also associated with a 73% reduction in odds of accidental venipuncture compared with standard palpation or fluoroscopy guided access (3.1% vs 10.6%, respectively; OR: 0.27 [95% CI, 0.17 to 0.42]; p <0.0001, I^2=51%), Figure 1.

In conclusion, in this meta-analysis there was a significant reduction in

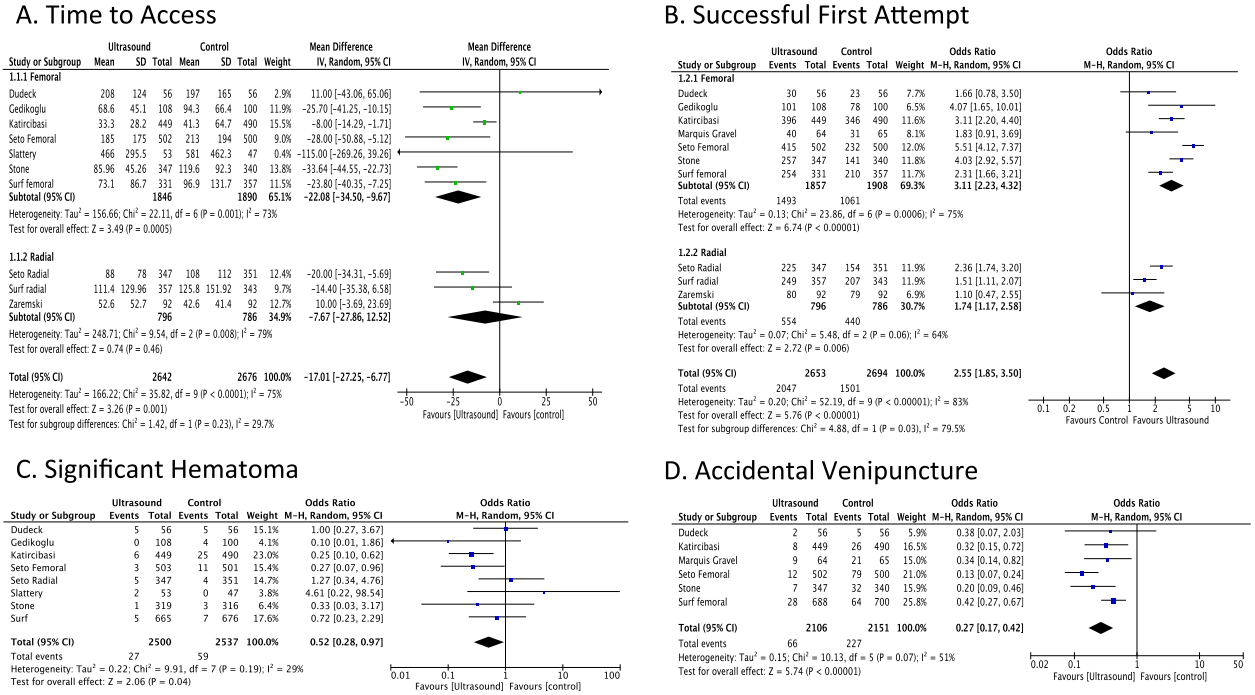

Figure 1. Forest plot of outcomes for ultrasound guided versus traditional vascular access. (A) Time to successful vascular access. (B) Odds of first attempt success. (C) Odds of significant hematoma development. (D) Odds of accidental venipuncture.
CI = confidence interval; M-H = Mantel-Haenszel.

the time to successful access, increased odds of first pass success, reduced odds of significant hematoma, and accidental venipuncture in patients randomized to ultrasound guided access compared with control. In sub-group analysis there was no significant reduction in time to engage the radial artery, presumably due to its superficial and more predictable location, however, more trials utilizing ultrasound guided radial access are warranted. Albeit a small mean difference of 17 seconds to successful access, this could prove important in emergent situations.

DECLARATION OF INTERESTS

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Transcatheter Edge to Edge Repair With MitraClip Among Renal Transplant Recipients

Renal transplant recipients are at higher risk for development of valvular heart disease, including mitral regurgitation.[1] The management of severe mitral regurgitation among renal transplant recipients poses a challenging dilemma. Renal transplant recipients have high postoperative risk with surgical mitral valve replacement, owing to their multiple comorbidities, immunosuppressed state and prior multiple surgeries.[1] Transcatheter Edge to Edge Repair (TEER) with MitraClip (Abbott Structural, Menlo Park, CA) is currently approved for patients with severe symptomatic primary mitral regurgitation at high risk for surgery, as well as patients with moderate-to-severe or severe symptomatic secondary mitral regurgitation on optimal guideline-directed medical therapy.[2,3] Interest has been directed to exploring the outcomes of TEER among the high-risk group of patients with prior renal transplant. Hence, we aimed to evaluate the outcomes of TEER among this group of patients using a large claim database.

The National Readmissions Database (2014 to 2018) was used to identify hospitalizations for TEER using International Classification of Diseases, Ninth and Tenth editions (ICD-9 and ICD-10) procedure codes “35.97 and 02UG3JZ.” Renal transplant recipients were identified using ICD-9 and ICD-10 diagnostic codes “V42.0 and Z94.0.” The study was designed to compare in-hospital mortality among renal transplant recipients versus patients who have not had transplants. Multivariable regression analysis was conducted to adjust for clinical variables that were significant on univariable analysis. This study was exempt from institutional review board evaluation, since data from the NRD are publicly available and devoid of personal identifiers. All statistical analyses were conducted using the SPSS software (IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY: IBM Corp Released 2017).

Among 23,835 hospitalizations for TEER, 134 hospitalizations were among renal transplant recipients.