

# Acute Kidney Injury After Transcatheter Aortic Valve Replacement: A Meta-Analysis

Wonngarm Kittanamongkolchai, M.D.<sup>1</sup>; Charat Thongprayoon, M.D.<sup>1</sup>; Wisit Cheungpasitporn, M.D.<sup>1</sup>; Narat Srivali, M.D.<sup>2</sup>; Kianoush B Kashani, M.D.<sup>1, 2</sup>

<sup>1</sup>Division of Nephrology and Hypertension, <sup>2</sup>Division of Pulmonary and Critical Care Medicine, Mayo Clinic, Rochester, MN

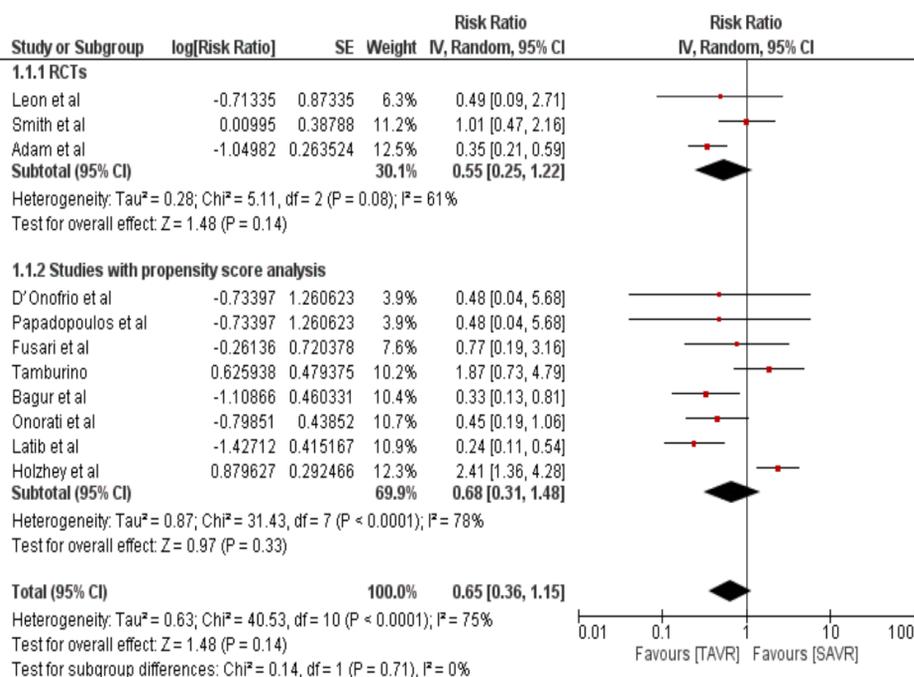
## Study Aim

The objective of this meta-analysis was to evaluate the risk of acute kidney injury (AKI) in patients who underwent transcatheter aortic valve replacement (TAVR).

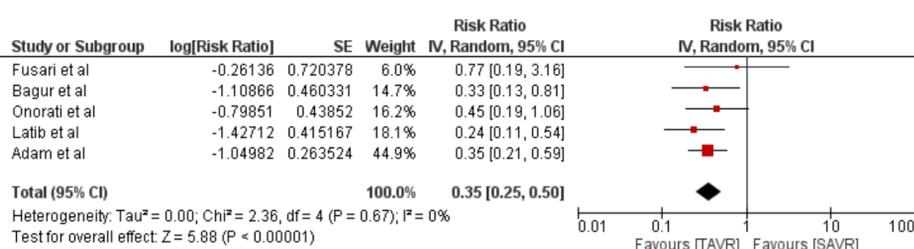
## Methods

A literature search was performed using MEDLINE, EMBASE, and Cochrane Database of Systematic Reviews and clinicaltrials.gov from inception through October, 2014. Studies that reported relative risks, odd ratios or hazard ratios comparing the AKI risk in patients who underwent TAVR versus those who had surgical aortic valve replacement (SAVR), were included. We performed the pre-specified sensitivity analysis including only propensity score-based studies. Mortality risk was evaluated among the studies that reported AKI outcome. Pooled risk ratios (RR) and 95% confidence interval (CI) were calculated using a random-effect, generic inverse variance method.

## AKI risk in TAVR vs. SAVR

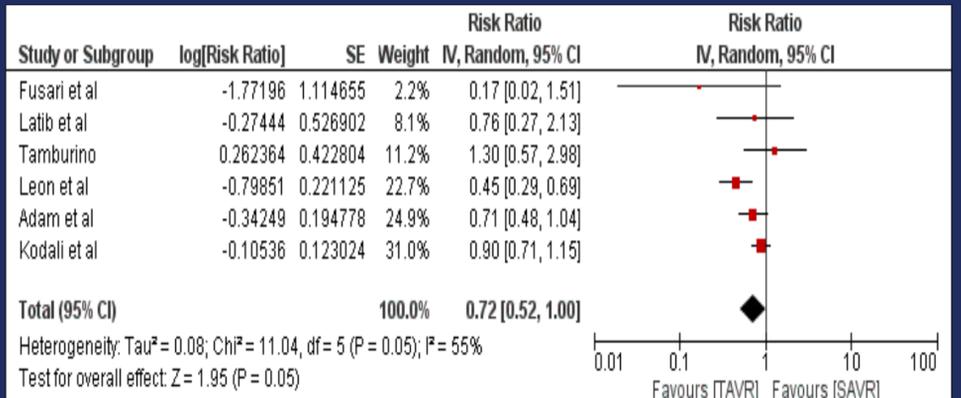


Forest plot of the RCT and cohort studies with propensity score comparing AKI risk in patients who underwent TAVR and those with SAVR



Forest plot of the RCT and cohort studies with propensity score using standard AKI definition comparing AKI risk in patients who underwent TAVR and those with SAVR

## Mortality risk in TAVR vs. SAVR



Forest plot of the RCT and cohort studies with propensity score comparing long-term mortality risk in patients who underwent TAVR and those with SAVR

## Results

- 3 randomized controlled trials (RCTs) with 1852 patients and 14 cohort studies with 3113 patients were enrolled in analysis to assess the risk of AKI in patients undergoing TAVR.
- The pooled RRs of AKI in patients undergoing TAVR were 0.65 (95% CI, 0.36-1.15, I<sup>2</sup>=75%) in analysis of RCTs and propensity score-based studies and 0.76 (95% CI, 0.44-1.34, I<sup>2</sup>=79%) in analysis of observational studies. Sensitivity analysis in RCTs and propensity score-based studies using standard AKI definition demonstrated a significant association between TAVR and lower incidence of AKI (RR: 0.35; 95% CI 0.25-0.50, I<sup>2</sup>=0%).
- Our meta-analyses of RCT and studies with propensity score analysis did not find associations between TAVR and reduced risks of severe AKI requiring dialysis (RR: 0.82; 95% CI 0.38-1.79, I<sup>2</sup>=63%) and short-term mortality (RR: 0.84; 95% CI 0.56-1.26, I<sup>2</sup>=9%).
- However, we found a significant reduced long-term mortality in patients who underwent TAVR compared to patients who had SAVR with a pooled RR of 0.72 (95% CI, 0.52-1.00, I<sup>2</sup>=55%) in the meta-analysis of RCTs and propensity score-based studies.

## Conclusions

- Our meta-analysis demonstrates an association between TAVR and lower risks of AKI.