

The Effect of Transcatheter Mitral Valve Replacement on Short-Term Mortality in Patients with Chronic Kidney Disease: A Systematic Review and Meta-Analysis

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Background

Transcatheter Mitral Valve Replacement (TMVR) offers clinically significant benefit to select symptomatic patients with severe Mitral Regurgitation (MR). Appropriate patient selection is crucial to ensure that patients most likely to benefit are treated. There is limited data on the effect of TMVR on mortality in patients with chronic kidney disease (CKD).

Methods

We conducted a systematic review and meta-analysis of clinical trials and observational studies reporting on outcomes of patients with CKD undergoing TMVR. We searched three databases on the Ovid platform (Ovid MEDLINE, EMBASE, EBM reviews) from inception to October 13, 2019. A random-effects model was used to estimate the pooled odds ratio across the included studies. We identified 1037 articles of which 5 articles were included based on pre-specified inclusion criteria.

Results

A total of 7232 patients were treated with TMVR from August 2008 to June 2016 with follow up ranging from 30 days to 2 years. 5125 patients (71%) of patients had CKD defined as a GFR below 60 mL/min/1.73m². Overall, TMVR is associated with increased 30-day mortality in patients with CKD (OR: 1.77, $P < 0.05$). Further subgroup analysis confirmed this signal in patients with a GFR < 30 mL/min/1.73m² (OR: 3.18, $P < 0.05$) but not in patients with a GFR 30-60 mL/min/1.73m² (OR: 1.32, $P = 0.13$).

Discussion

CKD overall is a predictor of 30-day mortality in patients undergoing TMVR. More specifically, a GFR < 30mL/min/1.73m² conveys a significant increase in 30-day mortality, while a GFR 30-60mL/min/1.73m² does not share this association. This implies a severity-dependent relationship between mortality and CKD following TMVR. The etiology driving this process is unclear but may be related to multi-system effect of severe CKD.