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ABSTRACT

Background

Stroke is a major cause of morbidity and mortality in trans-aortic valve replacement (TAVR). Despite the relatively high safety profile of newly developed cerebral embolic protection device (CEPDs) and advanced TAVR techniques, recent data on efficacy of CEPDs is still inconclusive. The aim of this meta-analysis is to determine the efficacy of CEPDs in reducing in-hospital mortality, in-hospital stroke, major adverse cardiac and cerebrovascular events, 30-day stroke rate, transient ischemic attack, delirium, vascular complications, in-hospital major bleeding and volume of cerebral lesions on magnetic resonance imaging among patients who underwent TAVR.

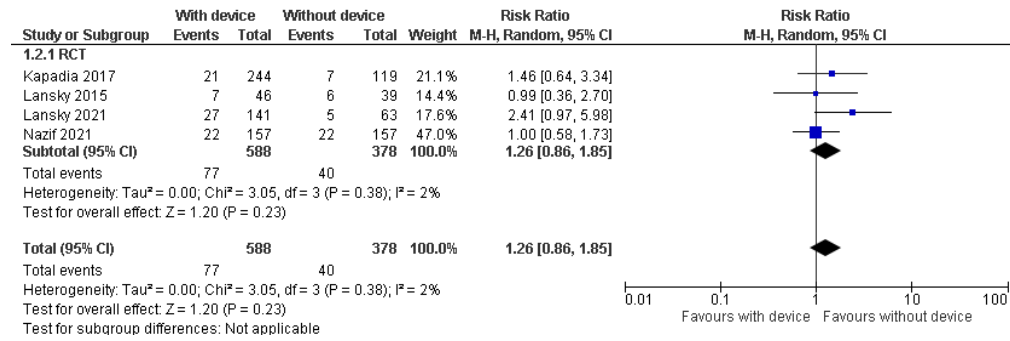
Methods: A comprehensive literature search on CEPDs and TAVR published between January 2015 and June 2022 was done through MEDLINE and Cochrane databases. Full text of eligible articles was obtained and evaluated for final analysis. Statistical analysis was performed using a random-effects model to calculate for the risk ratio (RR).

Results: Seven randomized controlled trials (RCTs) and 6 observational cohort studies (OCSs) involving 126,635 patients were included for analysis. CEPD was associated with a significant reduction of **in-hospital mortality** (RR 0.66; 95% CI 0.54–0.81), **in-hospital stroke** (95% CI 0.69–0.93), and **30-day mortality** (RR 0.72; 95% CI 0.52–0.99). No significant difference was observed in major adverse cardiac and cerebrovascular events, 30-day stroke rate, transient ischemic attack, delirium, vascular complications, in-hospital major bleeding and volume of cerebral lesions on magnetic resonance imaging.

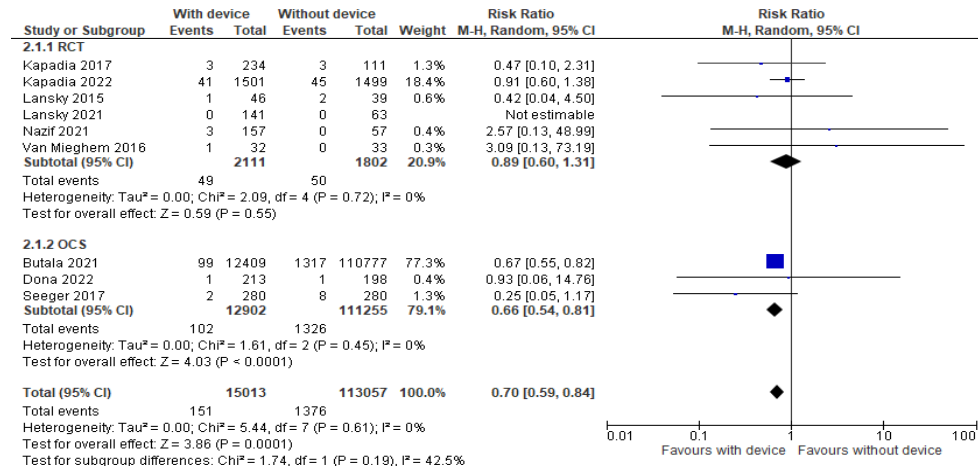
Conclusion

CEPD device use in TAVR is associated with a reduction of in-hospital mortality, in-hospital stroke and 30-day mortality. However, these results are driven mainly by observational studies. The reduction in events are driven mainly by OCSs. Large RCTs are needed to determine efficacy and safety of CEPD use during TAVR.

A.



B.



C.

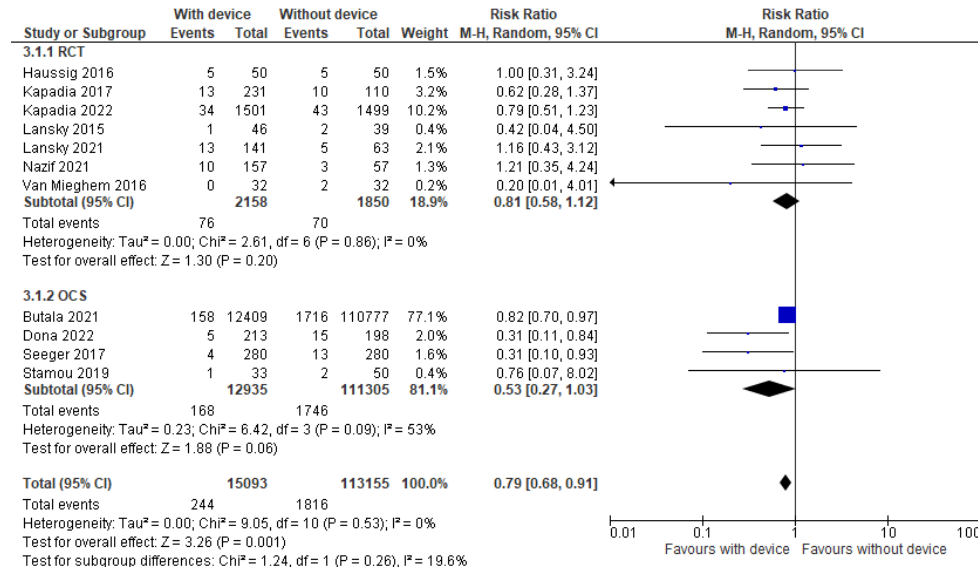


Figure 1: A. Forrest plot showing the risk ratio for major adverse cardiac and cerebrovascular events. **B.** Forrest plot showing the risk ratio for in-hospital mortality as well as subgroup analysis based on study design. **C.** Forrest plot showing the risk ratio for in-hospital stroke as well as subgroup analysis based on study design.

