Emergency interventional treatment of cardiogenic shock due to decompensated aortic stenosis: a systematic review and meta-analysis

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Introduction: Cardiogenic shock (CS) induced by severe aortic stenosis (AS) represents a critical condition with a high mortality rate. Its optimal treatment is still unclear due to the recent advances in interventions and supportive therapies. Emergency transcatheter aortic valve implantation (eTAVI) as definitive therapy and emergency balloon aortic valvuloplasty (eBAV) as bridge to intervention are viable therapeutic options, but it is still unclear which strategy provides the best outcomes.

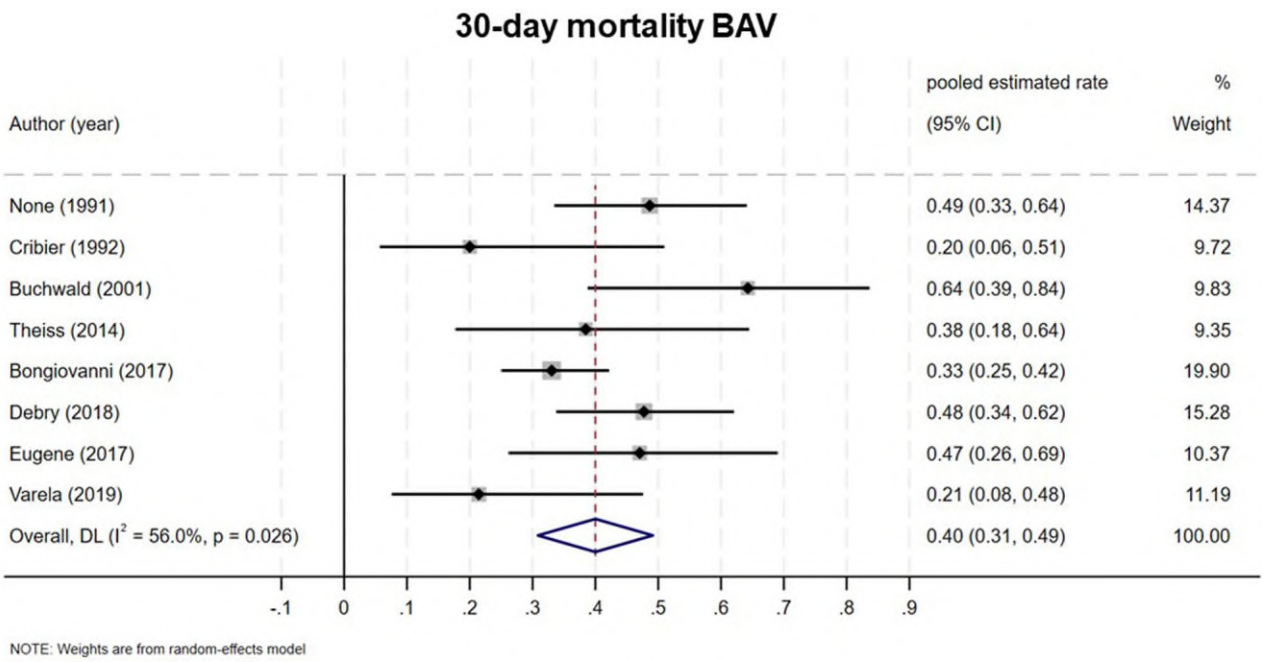
Purpose/Objective: This meta-analysis aimed to investigate the effectiveness and safety of eTAVI versus eBAV in patients with cardiogenic shock due to severe aortic stenosis. The primary endpoint was mortality at 30-day. Secondary outcomes were 1-year mortality and vascular and bleeding complications as well as incidence of pacemaker implantation.

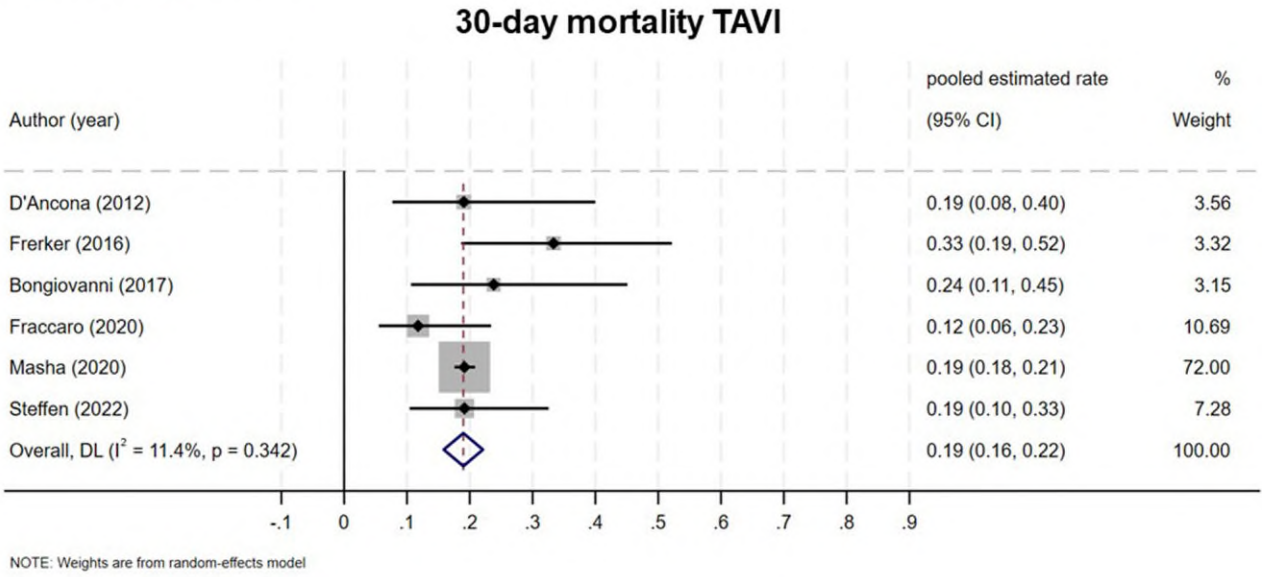
Methods: We performed a systematic literature review to identify relevant studies reporting outcomes of patients undergoing eBAV or eTAVI due to CS. Studies conducting eTAVI or eBAV in patients with cardiogenic shock due to severe aortic stenosis were included. Data extraction and analysis were performed to evaluate mortality rates at 30 days and 1 year, as well as secondary endpoints including procedural complications.

Results: 15 studies were included in the meta-analysis (6 for eTAVI, 10 for eBAV, one study comparing the two strategies) with a total of 2702 patients.

The pooled estimated rate for mortality at 30 days was 19% (I^2= 11.4%; CI 0.16, 0.22) for eTAVI and 40% (I^2= 56%; CI 0.31, 0.49) for eBAV while the pooled estimated rate for mortality at one year were 66% (I^2= 27.1%; CI 0.57, 0.75) and 45% (I^2= 82.8%; CI 0.21, 0.69) for eBAV and eTAVI respectively. Pooled estimated rate for any bleeding was 11% (I^2= 54.3%; CI 0.02, 0.21) for eBAV and 11% (I^2= 88.3%; CI 0.02, 0.20) for eTAVI, while for major vascular complications were 6% (I^2= 72.7%; CI 0.00, 0.13) and 7% (I^2= 52.1%; CI 0.03, 0.11) for eBAV and eTAVI respectively. As expected, pooled estimates for pacemaker implantation was high for eTAVI 9 %(I^2= 0%; CI 0.08, 0.10) while 1% (I^2= 9.5%;CI 0.0, 0.05) for eBAV.

Conclusion: Using the totality of existing evidence, this study synthesizes the current evidence to elucidate the benefits and risks associated with eTAVI and eBAV in patients with CS due to AS. eTAVI procedure has beneficial survival rates, while it is associated with higher pacemaker implantations. While these findings are hypothesis generating only, as selection bias and other confounders cannot be excluded, they provide valuable insights to guide clinical decision-making in CS patients.





30-day mortality