



**Comment on “Transcatheter Aortic Valve Replacement in Patients with Pure Native
Aortic Valve Regurgitation: A Systematic Review and Meta-analysis”**

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Risk Score

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Dear Editor,

The timely publication by Haddad et al. entitled “**Transcatheter Aortic Valve Replacement in Patients with Pure Native Aortic Valve Regurgitation: A Systematic Review and Meta-analysis**” in the journal *Clinical Cardiology* addresses one of the topics which is receiving increasing attention in cardiovascular intervention field [1].

Efforts continue in order to enhance the technical feasibility and improve the clinical efficacy of transcatheter techniques for aortic valve replacements in inoperable patients with native valve insufficiency or degenerated bioprosthetic valves [2-3]. Furthermore, with the advent of the second-generation transcatheter aortic valves, the indication for transcatheter aortic valve replacement (TAVR) will be potentially expanding. Nevertheless, appropriate patient selection, optimal preoperative risk assessment, and effective postoperative care are mandatory measures to achieve a successful TAVR in patients who have been deemed contraindicated for surgical AVR due to a high-risk for postoperative morbidity and mortality.

In order to evaluate 30-day mortality in patients with pure native degenerative aortic regurgitation undergoing TAVR, Haddad et al. performed a meta-analysis of 12 studies encompassing 638 patients [1]. All-cause 30-day mortality was pooled at 11% (95% CI: 7%-16%; $I^2= 20.86\%$), with a sub-group analysis revealing such a rate at 15% (95% CI: 10%-20%; $I^2= 10\%$) and 7% (95% CI: 3%-13%; $I^2= 37\%$) for the first-generation and second-generation aortic valves, respectively. Furthermore, a sub-group interaction analysis showed a success rate of 92% for the second-generation aortic valves versus 68% for the first-generation valves.

A multivariate analysis of the French Aortic National CoreValve and Edwards (FRANCE 2) has demonstrated that a larger logistic EuroSCORE, TAVR approach (transapical vs.

transfemoral), and periprosthetic regurgitation grade of 2 or more are independent predictors of 1-year mortality after Transcatheter aortic-valve implantation in elderly with aortic stenosis [4]. The meta-analysis by Haddad et al. could have taken these determinants into consideration and performed a sub-group analysis based on preoperative logistic EuroSCORE. Moreover, the authors could elaborate more on the different success rate between the 1st and the 2nd generation aortic valves by stratifying the patients based on the preoperative risk score.

Meta-analysis is a useful tool for summarizing data of the independent studies by increasing the statistical power to pool the data for the outcome of interest while controlling for the false positive results [5]. Although there are multiple approaches to combine the data from different studies, they share a mutual feature which is giving a proportional weight to the data on each variable based on the study sample size and the reported variance. The so-called weighted average aims to calculate the average of a set of values based on their level of significance and relevance.

As discussed above, it seems interesting that Haddad et al. would assign appropriate weight to the reported all-cause 30-day mortality based on the average EuroSCORE by each study. If done so, the authors could more realistically interpret the pooled data on 30-day mortality following TAVR, given the fact that the EuroSCORE in the study population widely ranged from 18.2 to 33% which puts a huge variability between the studies in terms of the reported risk for all-cause 30-day mortality rate.

In summary, we believe that postoperative 30-day mortality in patients with different baseline risk categories should be interpreted based on their preoperative surgical risk for TAVR. With that being said, patients with aortic valve pathologies undergoing surgical or endovascular

interventions should be weighted differently based on their EuroSCORE, when evaluated for post-procedure outcome of interest.

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