Transcatheter Aortic Valve Implantation Versus Surgical Aortic Valve Replacement

To the Editor:

We read with great interest the recent publication by Takagi and associates [1], in which they concluded that transcatheter aortic valve implantation (TAVI) did not reduce the early (odds ratio, 0.92; 95% confidence interval, 0.70 to 1.19; \( p = 0.52 \)) and midterm (hazard ratio, 0.99; 95% confidence interval, 0.83 to 1.17; \( p = 0.89 \)) all-cause mortality in high-risk patients with severe aortic stenosis as compared with surgical aortic valve replacement (SAVR). Their study is interesting, and may provide important implications for clinical practice.

However, several intrinsic limitations of this meta-analysis that were not reported in the study should be noted. First, TAVI and SAVR were both applicable to high-risk patients with severe aortic stenosis, but they had different indications. Transcatheter aortic valve implantation was especially suitable to patients whose risk was too high to undergo SAVR. Obviously, the randomized controlled trials included in the meta-analysis did not consist of those patients who were usually considered inoperable; otherwise it is deemed to be unethical. In this study, it included a group of patients with comparably low risk who were suitable to both TAVI and SAVR. Therefore, there was significant selection bias, and the conclusion was not applicable to all high-risk patients with severe aortic stenosis.

Second, in this meta-analysis, the study by Appel and associates [3] was excluded because the EuroSCORE was significantly higher in the TAVI group compared with the SAVR group (16% ± 11% versus 8% ± 4%; \( p = 0.001 \)). In this observational study, there were no significant differences in 30-day mortality, stroke, and myocardial infarction. This indicated the superiority of TAVI over SAVR in higher-risk patients with aortic stenosis. Therefore, exclusion of the study from the meta-analysis added the potential for publication bias to the pooled analysis.

Therefore, the results of the meta-analysis must be interpreted with caution, and further studies should be considered to confirm the results.

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References

Reply

To the Editor:

We would like to greatly acknowledge the correspondence by Prof. Zhang and associates [1] regarding our recently published meta-analysis [2] of transcatheter aortic valve implantation (TAVI) versus surgical aortic valve replacement (AVR) in patients with severe aortic stenosis. We are pleased to reply to their correspondence.

First, our meta-analysis included studies enrolling not only low-risk patients but also moderate-risk and high-risk patients. Of 11 studies with matched or randomized TAVI and AVR groups, two studies included patients with logistic European System for Cardiac Operative Risk Evaluation (EuroSCORE) of less than 10%, four studies enrolled patients with logistic EuroSCORE of 10% to 20%, and five studies included patients with logistic EuroSCORE of more than 20%. Patients with a logistic EuroSCORE of more than 20% are never low-risk ones. We herein performed another meta-analysis stratified by the logistic EuroSCORE using 11 studies with matched or randomized TAVI and AVR groups. Pooled analysis demonstrated no statistically significant difference in early (30-day or inhospital) all-cause mortality among patients assigned to TAVI versus AVR in all three logistic EuroSCORE stratified subgroups, without subgroup differences (Fig 1). Hence, TAVI may not reduce early all-cause mortality over AVR in not only low-risk patients but also in moderate-risk and high-risk patients. Additionally, such an “inoperable” patient (cannot undergo surgery) as was included in the Placement of Aortic Transcatheter Valve (PARTNER) trial cohort B [3] is one thing, and such a “high-risk” patient as was enrolled in the PARTNER cohort A (reference 7 in the original article) is quite another.

Second, in our meta-analysis, we strictly selected (and then combined) only adjusted risk estimates for all-cause mortality from observational studies. We could abstract only crude risk estimates from the study by Appel and coworkers (reference 25 in the original article) with heterogeneous groups despite matching by means of a number of baseline characteristics of the patients. Further, even including the study in our meta-analysis did not substantively alter the overall results (odds ratio for early mortality 0.93; 95% confidence interval: 0.71 to 1.20; hazard ratio for late mortality 1.00; 95% confidence interval: 0.84 to 1.19). Furthermore, in our original meta-analysis not including the study, there was no evidence of significant publication bias by the adjusted rank correlation and linear regression tests.

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