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EDITORIAL COMMENT

Racial Difference in Mortality After Transcatheter Aortic Valve Replacement*

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After 2 decades of its history, transcatheter aortic valve replacement (TAVR) has become an established treatment for patients with symptomatic severe aortic stenosis across all surgical risks, and the number of patients undergoing TAVR is increasing worldwide.[1,2] However, TAVR procedures still have certain procedural risks; therefore, the indication of this procedure should be cautiously considered, accounting for the balance between the risk and benefits of TAVR as well as the longevity of each patient.

The Society of Thoracic Surgeons (STS) score was originally developed in the United States to predict 30-day mortality after cardiac surgery, and it is considered 1 of the most reliable risk models for predicting surgical risk.[3] This score has also been applied to predict the procedural risk of TAVR.[1,2] However, information on its predictive value for short- and long-term mortality after TAVR is still limited. Furthermore, because most of the large randomized controlled trials were conducted in Western populations[4,5] and racial differences in the prognostic impact of the STS score on mortality have not yet been investigated, it is still unknown whether these results can be applied to Asian populations.

In this issue of *JACC: Asia*, Kim et al[6] demonstrated the results of a multinational multicenter registry-based study (Trans-Pacific TAVR Registry) comparing clinical outcomes between Asians and non-Asians according to low, intermediate, and high STS score stratification in 1,412 patients (581 Asians and 831 non-Asians). To our knowledge, this is the first large study to compare the clinical outcomes after TAVR according to racial differences. In this study, the distribution of the STS risk score group was quite different between the Asian and non-Asian groups (62.5% low, 29.8% intermediate, and 7.7% high risk in the Asian group vs 40.6% low, 39.1% intermediate, and 20.3% high risk in the non-Asian group). In Asian populations, all-cause mortality at 1 year was higher in the high-risk STS group than in the low- and intermediate-risk groups, which was mainly driven by "noncardiac mortality." In contrast, there was a proportional increase in all-cause mortality at 1-year mortality according to the STS risk category in non-Asians. These findings in Asians and non-Asians in the current study were in line with the major findings of previous studies,[7,8] thus raising the reliability of this study. This study is unique in that it clarified the racial differences in the baseline characteristics and clinical outcomes of TAVR according to the STS risk category for the first time. In addition, the authors also demonstrated the limitation of the discriminative capacity of the STS score for mortality prediction in an Asian population.

However, the translation of this study into daily practice requires careful consideration. First, this was an observational study from different countries; thus, the selection of eligible patients for TAVR, technique, and surveillance after TAVR generates intersite variability. Because TAVR is a still growing technique and indications for TAVR are changing, getting younger, and spreading to patients with less surgical risk, the difference in the TAVR procedure period in each center might also affect the clinical outcomes. However, this difference was not considered in the present study. Second, the observed early mortality rate was lower than the predicted mortality rate calculated using the STS score. These findings may indicate that the estimated early mortality risk (ie, the STS score) cannot be directly applied when predicting early complications after the TAVR procedure and, further, when predicting long-term mortality

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regardless of race. Our OCEAN-TAVI (Optimized Transcatheter Valvular Intervention-Transcatheter Aortic Valve Implantation) registry also demonstrated a lower 30-day mortality rate than the STS score.[9] Third, the precise reasons for the differential prognostic pattern of the STS score category for 1-year mortality between Asians and non-Asians were not clearly demonstrated in this study. The authors speculated the reason why 1-year all-cause mortality proportionally increased with increasing STS score category in non-Asians, whereas this proportional trend was not found in Asians. The authors also reported that the main reason for all-cause death was driven by noncardiac mortality (ie, there may be epidemiologic differences between Asians and non-Asians regarding the chief reasons for death). In Asia and Japan, cancer is the leading cause of death in the elderly, whereas in European countries, cardiovascular disease is the leading cause of death in the elderly. Whether these racial differences in the leading causes of death affect the different clinical outcomes has not yet been clarified, and the overall findings should be interpreted as hypothesis generating.

Currently, several clinical risk models other than the STS score for predicting 1-year mortality after TAVR have been reported. A simple and reliable tool for risk stratification is required in daily clinical practice. The OCEAN-TAVI registry has demonstrated a risk model for 1-year mortality in a Japanese cohort. In the validation cohort, receiver-operating characteristic curve analysis of the model showed good discrimination ability, with an area under the curve of 0.763 (95% CI: 0.728-0.795; $P < 0.001$).[10] Unfortunately, the association between STS score and all-cause mortality was not evaluated using logistic regression analysis. Further studies, possibly randomized controlled trials, whose baseline characteristics are equal are warranted to make a robust conclusion regarding this racial difference.

The authors should be congratulated for clarifying the racial differences in the characteristics, procedural outcomes, and prognosis of TAVR patients in real-world data for the first time.

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