Frailty Assessment
— An Indispensable Component of Transcatheter Aortic Valve Implantation —

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Transcatheter aortic valve implantation (TAVI) has emerged as a well-established treatment for patients with high- and intermediate-surgical risk symptomatic severe aortic stenosis (AS). However, it is still challenging to identify patients who can benefit from this treatment because it is a more elderly cohort compared with other cardiovascular diseases. To identify the optimal candidates for TAVI, sufficient screening and risk stratification are required. However, the classical surgical risk scores have limitations to predict prognosis after TAVI.

The concept of frailty has been widely accepted as a geriatric syndrome of impaired resilience to stressors, which leads to a high risk for adverse health outcomes. There have been many reports concerning the value of frailty markers to predict clinical outcome after TAVI. To achieve better discrimination, multimodal frailty scales are used. The Fried scale reflects strength, mobility, weight loss, fatigue, and activity. The Clinical Frailty Scale (CFS) broadly reflects the patient’s functional abilities, and is predictive of survival after TAVI, whereas the Short Physical Performance Battery (SPPB) narrowly reflects only the patient’s lower-extremity muscle function. Other TAVI-specific frailty scales have been developed (Figure). However, the prognostic value of frailty scales in patients undergoing TAVI have not been fully elucidated. There remains paucity of data on the effect of these frailty scales on readmission after TAVI. Moreover, most of the clinical frailty scales are considered too complex for daily use, and precise comparison has not been made yet.

In previous issue of the Journal, Saji et al report the effect

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of frailty scales on unplanned hospital readmission after TAVI. This study was the first to compare widely used frailty scales for predicting unplanned readmission after TAVI. The strength of this study was the complete dataset of frailty scales in the 155 patients. Now that the indication of TAVI is shifting toward the lower-risk subset, not only prognosis but also quality of life, including prevention from readmission, is increasing in importance. That is why this study is so important and relevant to our daily clinics in the era of contemporary TAVI. As described by the authors, there was a limited number of patients in a single-center registry. Further studies with larger sample sizes in multicenter registries are of great interest to draw robust conclusions.

Currently, the OCEAN-TAVI registry has reported several studies regarding the effect of frailty on clinical outcome after TAVI. It has been demonstrated that classical scales such as gait speed and grip strength were associated with increased mortality after TAVI in a large multicenter Japanese cohort. Nutrition and albumin are also important for predicting worse outcomes after TAVI. Low lean body mass, which represents sarcopenia, was also associated with higher mortality. Interestingly, cognitive impairment was also associated with increased incidence of sepsis, resulting in higher 1-year mortality in this registry.

Last but not least, the CFS, which is a simple eye-ball-evaluated scale, was predictive of death after TAVI. Follow-up data and interval change of these frailty scales were also of great interest and further studies are required to address these clinical questions. Frailty is multifactorial, so a comprehensive understanding of these factors and the practical application of these frailty scales are of great importance for better patient selection and optimizing clinical outcome after TAVI.

In the early learning curve of TAVI, it was a struggle to minimize procedural complications that directly lead to an increase in mortality. Risk stratification using classical surgical risk has its limits in predicting outcome after TAVI. Nowadays, the clinical outcomes after TAVI have dramatically improved by overcoming complications, through the advent of new devices and shifting the indication to lower risk patients. To further improve clinical outcomes, comprehensive and multimodal frailty assessment before TAVI has emerged as an indispensable and critical component of this procedure in the current era. The current study sheds light on improved patient selection strategies before TAVI.

Conflict of Interest Statement
K.H. is a clinical proctor for Edwards Lifesciences.

References