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Commentary: Risk stratification in transcatheter aortic valve implantation—is weight merely a number?

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As indications for transcatheter aortic valve implantation (TAVI) expand, careful patient selection and evaluation of baseline patient comorbidities have become crucial for interventionalists. Nieuwkerk and colleagues¹ from University of Amsterdam have assessed the association between body mass index (BMI) and TAVI outcomes by pooling patient-level data of more than 12,000 patients from multiple global registries and prospective studies. They found no association between increased weight and 30-day mortality among patients undergoing TAVI for severe aortic stenosis. However, low patient weight was significantly associated with higher mortality at 1 year following TAVI (hazard ratio, 1.52; 95% confidence interval, 1.10-2.09; $P = .011$) but not at 30 days. The study by Nieuwkerk and colleagues¹ is impressive and a valuable addition to current TAVI literature. Before their findings are applied in clinical decision making, some points warrant discussion.

Although the large sample size of the study is certainly a forte of their study, the pooled data is observational, retrospective, and does not account for confounders that potentially explain the findings. Further, the only trial included in their pooled data was not designed to test the influence of weight on TAVI outcomes.² As noted by the authors in their database, obese and overweight patients undergoing



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CENTRAL MESSAGE

Preprocedural risk stratification for transcatheter aortic valve implantation must consider patient weight and body habitus in the context of all underlying comorbidities.

TAVI were younger compared with underweight patients, which may explain the higher long-term mortality in the latter population. Although BMI is a useful variable for gauging body habitus, it is dynamic and could change over time after TAVI with weight loss or gain. BMI does not also reflect body composition (percentage body fat vs muscle composition), which is more biologically relevant to the performance of TAVI and procedural complications. Being underweight may also be a surrogate for frailty and the presence of severe baseline comorbidities, and as such, may not constitute a negative prognostic marker for TAVI in itself. The data presented by Nieuwkerk and colleagues¹ clearly suggest this because there was no difference in procedural mortality between under- and overweight/obese patients at 30 days but only at 1 year, when mortality was significantly worse for underweight patients. In addition, device success was less frequent in underweight patients according to Valve Academic Research Consortium-2 consensus definition further supporting the frailty hypothesis.³

Despite these limitations, the authors deserve commendation for a well-performed analysis. They attempted to minimize known confounding in their retrospective analysis by employing robust statistical approaches, including multivariable adjustment, adjustment for multiplicity, and also employing a frailty term to address confounding. Their reported E-values also show low residual unmeasured confounding that further strengthen their conclusions. Until

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randomized evidence is available, this may constitute the most robust evidence on the subject.

Successful patient selection for TAVI and preprocedural risk stratification must consider patient weight and body habitus in the context of all underlying comorbidities. For sick and frail patients, nutritional status must be optimized before TAVI. In the absence of definitive randomized evidence, the weight of these patients is, unfortunately, merely a fluctuating metric.

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