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Commentary: The story of body mass index and transcatheter aortic valve replacement remains incomplete

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In this issue of *JTCVS Open*, van Nieuwkerk and coauthors¹ present a multicenter, international, retrospective analysis of the impact of body mass index (BMI) on outcomes following transcatheter aortic valve replacement (TAVR). Ultimately, 12,381 patients undergoing TAVR with either a balloon-expandable or self-expandable device between 2007 and 2018 were included in the authors' analysis. The primary endpoints of the analysis were 30-day and 1-year all-cause mortality and stroke. Secondary outcomes included stroke, myocardial infarction, life-threatening or major bleeding, requirement for a permanent pacemaker, and new-onset atrial fibrillation. On multivariable Cox regression, 1-year mortality was significantly higher among underweight patients (hazard ratio, 1.52; 95% confidence interval, 1.10-2.09) compared with normal-weight patients. Overweight and obese patients did not have a significantly different rate of 1-year mortality or stroke relative to normal-weight patients. Overweight and obese patients had a significantly higher rate of permanent pacemaker implantation, but a significantly lower rate of major or life-threatening bleeding.

This study, the largest retrospective analysis to date focused on the relationship between BMI and outcomes in

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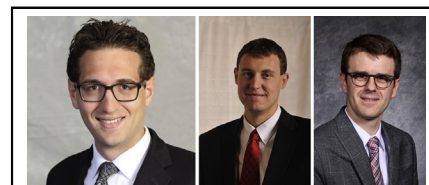
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CENTRAL MESSAGE

Body mass index (BMI) >25 kg/m² may not be associated with 1-year mortality after TAVR; however, underweight BMI remains an important marker of frailty and risk.

TAVR, refutes the “obesity paradox” of improved outcomes in overweight and obese patients undergoing TAVR while reaffirming our understanding that low BMI is an important marker of frailty and periprocedural risk.² We know that frailty and sarcopenia add significant risk not currently accounted for in the Society of Thoracic Surgeons risk models for surgical aortic valve replacement (AVR).³ Many of these high-risk and frail patients are directed toward TAVR; however, the adjusted odds ratio of 1-year mortality for underweight patients is 1.5, a considerable (50%) increase. The preprocedure discussion and counseling regarding TAVR needs to emphasize a continued relative risk for underweight and frail patients.

An important limitation of this article is the omission of rates of vascular complications in the study cohort. Obese anatomy often introduces additional difficulty in obtaining vascular access, and the tissues of underweight patients may be more prone to pseudoaneurysm as well. Recently, Sharma and colleagues^{4,5} reported that both underweight (BMI <18.5 kg/m²) and morbidly obese (BMI >40 kg/m²) patients had a significantly greater rate of minor vascular complications relative to patients with normal BMI (18.5-24.9 kg/m²). Despite what the term implies, “minor” vascular complications often require reintervention and include access-site injuries, such as pseudoaneurysm requiring thrombin injection, and failure of percutaneous closure resulting in the need for stenting or cutdown exposure to obtain hemostasis. The lower rate of major bleeding in obese patients undergoing TAVR needs further clarification, as does the higher pacemaker rate, both of which were largely ignored in the authors' discussion but warrant

consideration in determining valve choice, access site, and closure devices. In some cases, alternative access is required because of body habitus, a decision that will be difficult to account for in retrospective analyses.

As global experience with TAVR as the dominant technique for aortic valve replacement increases, risk counseling for patients suffering from severe, symptomatic aortic stenosis must evolve as well. These findings represent an important contribution to these conversations between patient and physician.

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