Another passenger for the TAVR speeding train

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Provenance: This is a Guest Editorial commissioned by Section Editor Busheng Zhang, MD, PhD (Department of Cardiac Surgery, Shanghai Chest Hospital, Shanghai Jiaotong University, Shanghai, China).

Comment on: Chandrasekhar J, Dangas G, Yu J, *et al*. Sex-Based Differences in Outcomes With Transcatheter Aortic Valve Therapy: TVT Registry From 2011 to 2014. J Am Coll Cardiol 2016;68:2733-44.

Submitted Apr 01, 2017. Accepted for publication Apr 10, 2017.

doi: 10.21037/atm.2017.04.30

View this article at: http://dx.doi.org/10.21037/atm.2017.04.30

Valve heart disease occurs with equal frequency in men and women and increases in prevalence for both gender with advancing age (1). However, the Society of Thoracic Surgeons database and the Northern New England Cardiovascular Disease Study Group registry revealed that valve surgery patients were predominantly male (62%), and female sex was associated with greater operative mortality (2).

A retrospective analysis of data from 2,197 patients who underwent isolated surgical aortic valve replacement (SAVR) from 2000 to 2011 at the German Heart Center revealed that compared with the male patients, females (41.3%) were older, presented with higher logistic European System for Cardiac Operative Risk Evaluation (EuroSCORE) scores, and more commonly exhibited New York Heart Association (NYHA) Class III or IV heart failure. After adjustment for baseline characteristics, female gender remained an independent predictor for 30-day mortality (3).

Transcatheter aortic valve replacement (TAVR) has been shown to improve survival and symptoms in patients with severe aortic stenosis who are deemed inoperable, or at high risk (4) and was non inferior to SAVR in the intermediate risk patients (5). Differently from surgical series, women treated by TAVR were approximately 50% (4,6) and seems to have a significant survival advantage compared to the male patients (4,6-18). The overall result of this pooled analysis of studies is shown in *Figure 1*.

The recent paper of Chandrasekhar *et al*. (10) is the largest reporting on the interaction between gender and outcome post-TAVR in more than 23,000 patients from the Society of Thoracic Surgeons/American College of Cardiology (STS/ACC) transcatheter valve therapy (TVT) registry. Consistently with previous series, 50% of the TAVR patients were female with a significant different risk profile compared to male patients. The women were older, frailer, with a worse renal function, severe mitral regurgitation and porcelain aorta. On the contrary, they had lower rate of coronary artery disease, previous myocardial revascularization, atrial fibrillation, diabetes and lung disease. The overall STS score was higher in women than men. On procedural ground, female patients were more likely treated by a non transfemoral approach (45% *vs.* 35% in men) and showed a higher rate of major vascular complications and need for conversion to open heart surgery because of aortic dissection, annulus rupture and coronary occlusion. Importantly, most of the patients in this study population received the old generation balloon expandable Edwards Sapien valve (Edwards Lifesciences, Irvine, California), which requires a 22 to 24 Fr delivery sheath. Notwithstanding the different and worse risk profiles, the women had a similar in-hospital mortality and an improved survival rate at 1-year follow up. Interestingly, looking at the survival curves, the increasing benefit appears 3–4 months after TAVR. As such, one may argue this finding might be related to the fewer comorbidities of the women, but the real explanation to this female selective advantage is not straightforward because data on mortality causes are lacking. Another limit is that we cannot exclude the role of unmeasured variables in retrospectively based

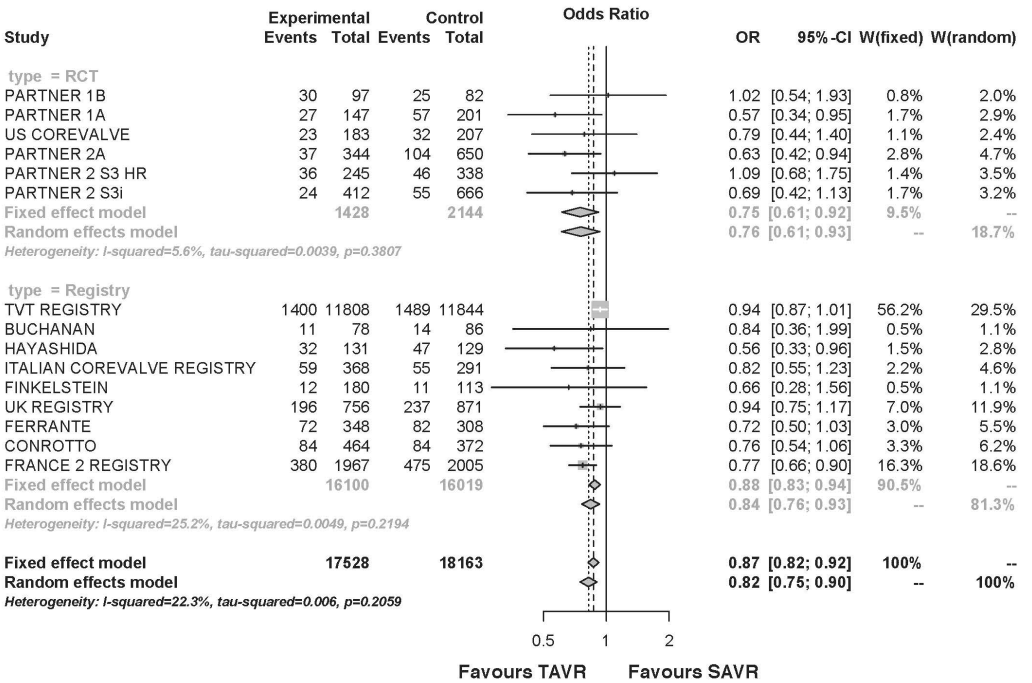

Figure 1 Forest plots showing the pooled-analysis of female (TAVR *vs.* SAVR) for the primary outcome of death from any cause at mid-term follow up (6 months–2 years) from the included studies. CI, confidence interval; OR, odds ratio; RCT, randomized controlled trial; SAVR, surgical aortic valve replacement; TAVR, transcatheter aortic valve replacement.

analysis especially when not adjudicated by an independent committee.

Finally, considering that (I) TAVR do not impact negatively female at early follow up; (II) the mean age of the TAVR patients is at large more than 80 years, we may argue that this observed gender related TAVR benefit may be simply related to the fact that in a short run of 4 to 5 years the natural and pre-existing longer life expectancy of the women, compared to men, may play a significant role. On the contrary SAVR has a negative impact on female at early follow up that might not be overtaken during follow-up (3).

Taken all together, we cannot overlook the TAVR related survival advantage of female (19), since looking at the past, when SAVR was the only option, female patient were frequently deemed to be at higher risk (see STS score) and so more frequently not operated compared to male. The WIN-TAVI (Women's International Transcatheter Aortic Valve Implantation) Real-World Registry is the first multicenter international registry dedicated to women investigating the safety and performance of contemporary TAVR and further exploring the influence of female-specific factors (20).

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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Cite this article as: Fraccaro C, Ueshima D, Tarantini G. Another passenger for the TAVR speeding train. Ann Transl Med 2017;5(16):334. doi: 10.21037/atm.2017.04.30

