

Clinical outcomes in patients after surgical and transcatheter aortic valve replacement

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After the first-in-man transcatheter aortic valve implantation (TAVI) performed by Alain Cribier in 2002, followed by the landmark results of the PARTNER I study (cohorts A and B), TAVI has been successfully used in inoperable patients or patients with high risk for surgical aortic valve replacement (SAVR).¹⁻³ Also lower-risk patients may benefit from this procedure.⁴ In a paper published in the current issue of the *Polish Archives of Internal Medicine (Pol Arch Med Wewn)*, Tokarek et al⁵ reported meaningful results of a small, nonrandomized (but corrected for propensity scores) study of transfemoral TAVI, isolated surgical aortic valve replacement, and 2 minimally invasive surgical cohorts (mini-sternotomy and mini-thoracotomy). Two conclusions drawn by the authors are particularly important: first, despite a significantly higher baseline risk profile of patients undergoing TAVI, there were no differences in mortality at 1 year and at the longest available follow-up period between the analyzed groups. Second, left ventricular ejection fraction (LVEF) was significantly reduced in all 3 surgical groups in comparison with patients undergoing TAVI 1 week after the procedure.

The first finding confirms the widely known and accepted results of the PARTNER I study. In a more recent randomized comparison of TAVI (with the use of self-expandable valves) with SAVR, mortality was even lower among patients who underwent TAVI, which may reflect greater experience of the operators, lower-profile delivery systems (and, in consequence, fewer bleedings and vascular complications), and lower-risk profile of recruited patients as measured by logistic euroSCORE, in comparison with PARTNER I.⁶ Interestingly, in a manuscript by Tokarek et al,⁵ the mean logistic euroSCORE of patients who underwent TAVI or aortic valve replacement in all surgical study arms was much lower than in the randomized comparison of TAVI with self-expandable prosthesis versus SAVR. This and mini-invasive surgical techniques may explain

very low surgical mortality, resulting in the lack of a significant difference in 1-year mortality between TAVI and surgery. Moreover, the different types of valves used in the TAVI group (balloon- and self-expandable) and (probably) in the surgical cohort as well as a small sample size may blur the difference in mortality rates and other study results.

Patients allocated to TAVI showed a significantly lower decrease in LVEF 1 week after the procedure in comparison with surgical patients. Interestingly, in PARTNER I, in a 2-year echocardiographic subanalysis, the TAVI group showed an immediate increase in LVEF with no further change at 2-year follow-up.⁷ SAVR followed the opposite pattern: no immediate increase in LVEF but a significant increase after 2 years without significant difference in comparison with TAVI after this period. This difference between an increase in LVEF over time in PARTNER I may be partly explained by a significantly larger effective orifice area (EOA) and indexed EOA in the TAVI group and a more common prosthesis-patient mismatch in the surgical group. Tokarek et al⁵ did not provide any information on the surgical valves used or echocardiographic parameters other than LVEF, which precludes further analysis and discussion of this topic. However, a lower decrease in LVEF after transfemoral TAVI in comparison with surgical treatment is encouraging and may generally reflect the different complex mechanisms of left ventricular remodeling after TAVI and SAVR.

To summarize, Tokarek et al⁷ presented a single-center experience with TAVI and compared the results with different surgical approaches to aortic valve replacement including also mini-invasive techniques, which adequately reflects the current status of SAVR. Despite the higher baseline risk profile in the TAVI group, 1-year mortality was similar and ejection fraction levels less reduced 1 week after the procedure. These findings are the best illustration of the ongoing evolution

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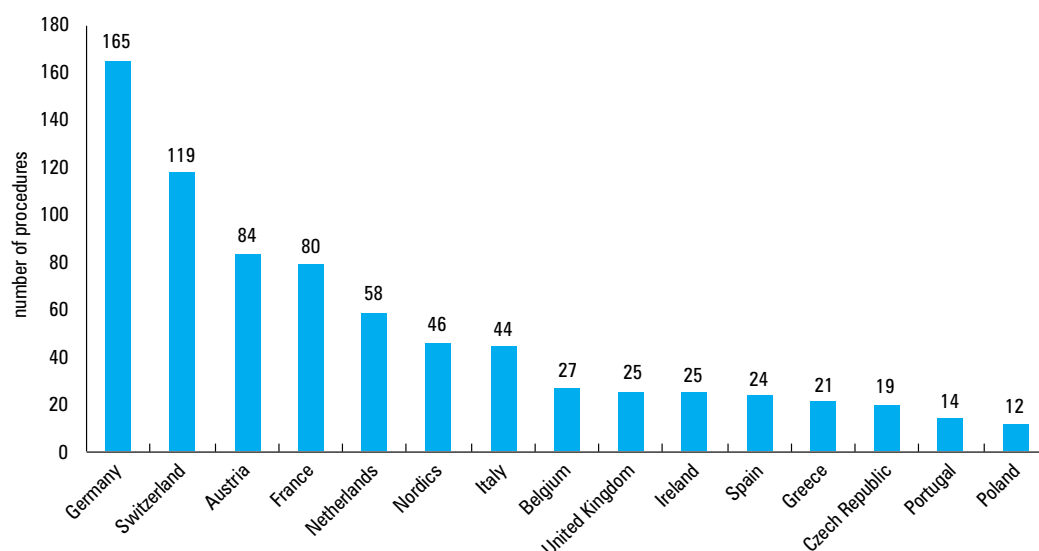
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FIGURE 1

Number of transcatheter aortic valve implantations per million inhabitants in selected European countries



of percutaneous techniques, which now allow to treat a continuously growing population of patients with valve diseases and have a good chance of becoming the standard of care very soon. However, the penetration of the TAVI procedure is unequal in Europe (FIGURE 1), and the most burning problem to solve in the coming future is to increase the availability of this promising and life-saving technology in Poland and some other European countries.

REFERENCES

- 1 Leon MB, Smith CR, Mack M, et al. Transcatheter aortic-valve implantation for aortic stenosis in patients who cannot undergo surgery. *N Engl J Med*. 2010; 363: 1597-1597.
- 2 Kodali SK, Williams MR, Smith CR, et al. Two-year outcomes after transcatheter or surgical aortic-valve replacement. *N Engl J Med*. 2012; 366: 1686-1695.
- 3 Vahanian A, Alfieri O, Andreotti F, et al. Guidelines on the management of valvular heart disease (version 2012): The Joint Task Force on the Management of Valvular Heart Disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS). *Eur Heart J*. 2012; 33: 2451-2496.
- 4 Thyregod HGH, Steinbrüchel DA, Ihlemann N, et al. Transcatheter versus surgical aortic valve replacement in patients with severe aortic valve stenosis: 1-year results from the all-comers NOTION randomized clinical trial. *J Am Coll Cardiol*. 2015; 65: 2184-2194.
- 5 Tokarek T, Sobczyński R, Dziewierz A, et al. Clinical outcomes in patients after surgical and transcatheter aortic valve replacement. *Pol Arch Med Wewn*. 2015; 125: 755-764.
- 6 Adams DH, Popma JJ, Reardon MJ, et al. Transcatheter aortic-valve replacement with a self-expanding prosthesis. *N Engl J Med*. 2014; 370: 1790-1798.
- 7 Hahn RT, Pibarot P, Stewart WJ, et al. Comparison of transcatheter and surgical aortic valve replacement in severe aortic stenosis: a longitudinal study of echocardiography parameters in cohort A of the PARTNER Trial (Placement of Aortic Transcatheter Valves). *J Am Coll Cardiol*. 2013; 61: 2514-2521.