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EDITORIAL

Optimizing Transcatheter Aortic Valve Implantation Could Make It Even More Cost-Effective!

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This year (2017) we have celebrated the 15th anniversary of transcatheter aortic valve implantation (TAVI); more than 200,000 procedures have been performed worldwide with a dramatic increase in more recent years. An overwhelming and enthusiastic literature has established TAVI as a real breakthrough. In parallel to continuous technology refinements, we observed a decrease of the risk-profile of patients undergoing TAVI in our institutions. Several steps led to the wide acceptance of TAVI. One of the hurdles to overcome was mortality. Initially quite high and related to the patients' comorbidities, a regular improvement in 30-day and 1-year survival has been observed, correlated to better transcatheter heart valves (THV) and increased operators' experience.[1] Apart from the Nordic Aortic stenosis (NOTION) trial, ongoing randomized studies will try to demonstrate the non-inferiority of TAVI in comparison to surgical aortic valve replacement (SAVR) for all-comers low risk patients.

The economic context in western countries precludes any larger adoption of TAVI, partly because of concerns about its cost-effectiveness.[2] In this issue of *Structural Heart*, Geisler and colleagues present an interesting Dutch perspective of TAVI cost-effectiveness, based on the CoreValve High risk pivotal trial. Cost-effectiveness has been the focus of few studies, among which a 2012 sub-analysis of the PARTNER IA trial, comparing TAVI with a balloon-expandable valve and SAVR in high-risk patients. In this trial, after stratification of the results by access route, transfemoral TAVI was associated to slightly lower 12-month costs and slightly increased quality-adjusted life years (QALY). At an incremental cost-effectiveness ratio < $50,000/QALY, transfemoral TAVI was economically attractive in 70.9% of bootstrap replicates, in comparison to only 7.1% of replicates in the transapical cohort.[3] From a United Kingdom perspective, a cost-utility analysis based on the National Institute of Clinical Excellence (NICE) reference case design for technology and TAVI/SAVR effectiveness from the PARTNER IA trial confirmed these findings in 2013. The cost-effectiveness acceptability curve indicated that at a NICE £20,000 willingness to pay threshold per QALY gained, TAVI had a 64.6% likelihood of being cost-effective, compared with 35.4% for SAVR.[4]

Most of the analyses were derived from a trial evaluating a balloon-expandable platform. As there are technical and outcome differences between balloon-expandable and self-expanding devices, dedicated economic study focusing on the latter type of THV are lacking. The work of Geisler and colleagues is the first analysis with a self-expanding device in a European country. The authors confirmed the cost-effectiveness of a transcatheter approach: TAVI was projected to add 0.41 (3.69 vs. 3.27) QALY at an increased cost of €9,048, resulting in an incremental cost-effectiveness ratio of €21,946 per QALY gained. The probability of TAVI being cost-effective was 71%. Further cost reduction of approximately €5,400 would be associated to a "lean" scenario and make TAVI the predominant option.

One of the main findings from this study is that optimizing TAVI could make it even more cost-effective as compared to SAVR. This simplification results from optimizing the number of operators and nursing staff, decreasing procedural time to reducing hospital stay with early discharge for selected patients.[5] Indeed, in the UK NICE analysis, despite greater procedural costs and THV prices, TAVI was cost-effective compared with SAVR over a 10-year model horizon. The reasons were greater postsurgical costs and hospital stay.

This meticulous and coherent analysis from Geisler et al. integrated rehospitalization in their economic model. Indeed, about 17% of TAVI patients are re-admitted within 30 days in the ACC STS/TVT registry.[6]

In conclusion, it is now obvious to any heart team across the globe that TAVI is superior to medical therapy in inoperable patients, at least equal to SAVR in high-risk patients and comparable to SAVR at 2 years in intermediate-risk ones, TAVI cost-effectiveness should not be questioned anymore.[7–10] Simplification and optimization of the TAVI pathway are key for future enhancement of its cost-effectiveness. We can be confident and anticipate continuous improvements in THV costs, clinical outcomes and hospital stay. However, before making TAVI the dominant therapy, durability needs to be assessed thoroughly.

Disclosure statement

The authors report no conflicts of interest. The authors alone are responsible for the writing and content of this article.

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