Valvular heart surgery: evaluating the past to enlighten the future

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Unlike the steady decline observed in coronary artery bypass graft (CABG) surgery rates over the last couple of decades [1], there has been a rise in non-congenital [2] and congenital heart valve operations through the last 10–15 years [3]. This upsurge can firstly be attributed to the increasing prevalence of degenerative valvular heart disease due to the rising age of the population worldwide. Secondly, improved surgical outcomes in asymptomatic patients [4, 5] and performance of surgery based on echocardiographic parameters, in addition to symptomatology, have led to more patients undergoing surgery in earlier stages of the disease [6], preventing progression to irreversible ventricular dysfunction that would, otherwise, have rendered them inoperable, thus indirectly contributing to growth in surgical volumes. Finally, the improvements in perioperative care of older and sicker patients with multiple comorbidities, better surgical techniques and the development of newer minimally invasive and transcatheter technologies in valve repair and replacement have enabled surgeons to treat patients who were previously considered to be prohibitively high risk for conventional surgical procedures. This alteration in patterns in valve surgery, observed globally, has been elegantly presented by Siregar et al. [7] in this edition of the journal through a comprehensive study involving a compilation of extensive data of 56,397 patients undergoing valve operations (excluding transcatheter procedures) derived by linking four nationalized databases developed at different periods during the last two decades in the Netherlands.

The authors noted that the annual volumes of valve operations doubled from 20/100,000 Dutch adults in 1995 to 43/100,000 in 2010 with similar trends also observed for isolated aortic valve (AV) and mitral valve (MV) surgeries. More than half of these surgeries were AV operations with or without CABG. A comparable trend in isolated valve procedures was observed in the voluntary registry of the German Society for Thoracic and Cardiovascular Surgery (GSTCVS) and the Society of Thoracic Surgeons (STS) database [2, 8].

In the current study, the authors reported an absolute reduction of 41 and 30% in the use of mechanical aortic and mitral prostheses, respectively, over the 16-year study-period. Similar observations were also described by Hamm et al. [9] on behalf of the German AV registry executive board. This enormous increase in implantation of bioprostheses is due to the lower incidence of thromboembolism and anticoagulation-related haemorrhage and improved durability due to technological advances in the manufacture of newer generation valves. The recent surge in transcatheter valve implantation has given an added impetus to surgeons to use biological valves because of the option of a transcatheter valve-in-valve procedure being available for patients not suitable or at a high risk for reoperations in the future. The most remarkable shift was seen in the large increment in the proportion of MV repairs from 47.1% of all MV surgeries in 1995 to 75.6% in 2010. This significant rise in MV repair surgery in the Netherlands is only a reflection of the trend that has set in most industrialized nations [8], most likely, due to the higher incidence of degenerative MV disease, which is more amenable to repair. Abundant evidence existing in the literature demonstrating better early and long-term outcomes in favour of repair has also attributed to this surge in the repair rate [9]. An increased impetus for AV repair has been observed in recent times, especially in patients with aortic regurgitation caused by a dilated aortic root. However, these technically challenging operations and controversial results of AV repair for degenerative aortic stenosis have restricted the rapid escalation in AV repair procedures as has been witnessed in case of MVS.

A lack of change in the preoperative risk profile of patients in this study is probably because these data were available only in 21,967 patients operated on between 2007 and 2010. One could speculate that if these data were available for all patients operated on since 1995, it would have revealed a worsening of the risk profile as evidenced by Lee et al. [2] in the STS database. The rationale behind significant reduction in overall hospital mortality (4.5–3.6% between 2007 and 2010), despite an unchanged risk profile, which is also mirrored in the STS database and the registry of GSTCVS [2, 8], is multifactorial. Increased awareness of a healthy lifestyle, performance of surgery earlier in the disease, improved perioperative management, advanced and minimally invasive surgical techniques, better quality of newer generation prostheses and closely monitored follow-up are some of the key developments that have resulted in better outcomes.

From the point of view of future perspectives, it should be emphasized that every country should invest in the development of a national registry, which would help monitor preoperative characteristics, quality of indications, operative details, postoperative outcomes and follow-up data of all patients undergoing valvular heart surgery. It would provide patients, relatives, clinicians and policy makers not only with insight into this rapidly progressing field, but also with a benchmark report to aid decision-making at the individual patient level and assist insurance companies and governing bodies in making major policy decisions. Inclusion of immediate postoperative and long-term complications (thromboembolism, anticoagulation-related haemorrhage, prosthetic valve...
endocarditis, structural valve dysfunction and valve-related mortality) of valve surgery, which is lacking in the present report, would help understand the impact of newer generation of valves and anticoagulation medications on long-term outcomes. Transcatheter valve procedures, especially transcatheter AV implantation and leaflet plication with MitraClip device, have been on the rise in the last 5 years [8], but have not been included in this study. It would be beneficial to incorporate these procedures in future registries so that such ‘all-comer’ registries can enable us to determine the extent to which these new technologies are being implemented and the outcomes they produce. A comparison of heart valve patient cohorts and outcomes between registries of different countries is currently extremely difficult due to the heterogeneity in definitions of risk factors and outcomes. In order to realize the above-mentioned goals, the national cardiac surgical associations of each country should strive to develop national registries in accordance with the guidelines for reporting mortality and morbidity after heart valve operations [10].

REFERENCES


