Journal of the American Heart Association

EDITORIAL

Surgical Treatment of Infective Endocarditis in Elderly Patients: The Importance of Shared Decision Making

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Infective endocarditis (IE) is increasing in prevalence and severity in most countries in the industrialized world, fueled by increasing comorbidities, intravenous drug abuse, medical interventions, and indwelling devices.[1] Despite advances made over the past 2 decades in the management of valvular heart disease, outcomes for IE remain essentially unchanged, with 20% in-hospital and 40% 1-year mortality.[2] Surgical valve repair or replacement is the recommended therapy for patients with IE who have severe valve dysfunction, heart failure, unresolving sepsis, and high embolic risk.[3–5] However, as the operative risk for valve surgery with IE is at least 2-fold greater than for degenerative valve disease, clinical decision making in some patients, particularly in older patients, can be vexing. Moreover, multivalve or invasive aortic root IE can be especially complex and requires experienced surgeons with a good support system. Elderly individuals are increasingly afflicted with IE and now represent nearly one third of patients with IE, but few studies have evaluated the "real-world" use of surgery among the octogenarian and nonagenarian population.[6–8]

See Article by Ragnarsson et al.

In this issue of the *Journal of the American Heart Association* (*JAHA*), Ragnarsson and colleagues present an analysis of 2186 patients with aortic and mitral valve IE in the Swedish Registry on Infective Endocarditis, which evaluates surgical use and outcomes stratified by age.[9] They found that only 6% of patients aged >80 years received surgery compared with 46% of patients aged <65 years. Although younger patients had higher rates of severe aortic (27% versus 9%) and mitral (23% versus 17%) dysfunction compared with older patients, the cause of this 8-fold surgical discrepancy is not explainable by clinical criteria alone. The older patients actually had more virulent bacteria, most notably *Staphylococcus aureus* (38% versus 31%), and lower (13% versus 19%) rates of central nervous system embolism, both unexpected findings and arguments favoring rather than warranting denial of surgery. This discrepancy in surgical use in real-world practice may not be surprising. However, surgical hesitancy by referring physicians, surgeons, and patients may be mitigated by evidence-based shared decision making between patients and experienced endocarditis teams and surgeons.

Age alone is not a contraindication to surgery. Although increased age is a risk factor, cardiac surgery outcomes among very elderly patients are now common with excellent survival and quality of life after a broad array of operations.[10,11] The Society of Thoracic Surgery endocarditis operative risk score for IE includes age >60 years as a statistically significant risk factor for major morbidity or mortality, yet it is a relatively low overall contributor toward risk compared with

Key Words: Editorials ■ aging ■ heart valve surgery ■ infective endocarditis ■ survival

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JAHA is available at: www.ahajournals.org/journal/jaha

clinical status and other comorbidities.[12] Aging is a heterogeneous process, with some older patients being more fit than some younger patients. Functional status and frailty assessment have become the norm when considering intervention for older patients with structural valve disease.[13] Similarly, comprehensive geriatric assessment and use of multidisciplinary endocarditis teams are essential in IE.[14]

One limitation of the analysis by Ragnarsson and colleagues is the inability to identify patients in their data set with clear surgical indications nor identify the reason for nonsurgical management. In an analysis of 2160 patients with IE in the European Infective Endocarditis Registry (EURO-ENDO) registry, Habib and colleagues found that 69% of patients met surgical indications, but surgery was only performed in 51% of patients, with high operative risk being the most common reason for refusal.[15] We certainly agree that surgery should only be performed in reasonable operative candidates. However, "risk aversion" is an observed phenomenon that may contribute to denial of surgery, resulting in a risk-treatment paradox, where patients at higher risk for adverse events receive less intensive treatment despite possibly obtaining greater benefit.[16,17] Risk aversion may be mitigated by referral to experienced valve surgeons at centers with access to the multidisciplinary team, including infectious disease, neurology, nephrology, geriatrics, and critical care, needed to handle IE-related complications.[3]

Notably, in the EURO-ENDO registry, patients refused surgery despite indications in 19% of cases. Surgical hesitancy among elderly patients is also present in patients with structural valve disease.[18,19] Shared decision making requires effective communication with patients and families about the risks and benefits of surgery. In the analysis by Ragnarsson and colleagues, patients who underwent surgery had a high 20% operative mortality, which was similar to the hospital mortality for the nonoperative patients. Still, in their propensity-matched comparison, 1- and 5-year survival was better in patients who underwent surgery compared with medically managed patients in all age groups. This may be attributable to ongoing valve dysfunction and heart failure in the nonoperated on patients: if you were not offered surgery for your valve dysfunction when you were infected, you are probably less likely to be referred for surgery later. Quality of life is an important decision-making factor in the elderly population, and freedom from heart failure is an important factor for survivors of endocarditis. Although there is an inherent selection bias in this data set, one can reasonably conclude that although operative risk may be high, midterm survival is improved in patients who receive surgery versus those who do not.

Surgery to remove infected prosthetic valves, to remove high-risk sources of embolism, and to restore functioning valve and cardiac integrity remains the cornerstone therapy for patients with advanced IE for survival and recovery. Elderly patients are increasingly afflicted with IE and should not be denied surgery on the basis of age alone. Shared decision making and experienced multidisciplinary teams are required for best evidence-based practice in these complex patients.

ARTICLE INFORMATION

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Disclosures

None.

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