

Editorial



Natural History Data in Symptomatic Severe Aortic Stenosis Alerts Cardiologists to the Dangers of No Action

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Conflict of Interest

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Korea surpassed the United States of America in terms of life expectancy in 2015 (82.16 vs. 78.74 years) according to the World Bank report.¹⁾ With greater longevity in Korea, aortic stenosis (AS) has topped the most common valvular heart disease. According to a meta-analysis, the prevalence of severe AS worldwide in subjects >75 years-old were 3.4%, and of those, three-fourths (75.6%) were symptomatic.²⁾ Surgical aortic valve replacement (SAVR) is strongly recommended for symptomatic patients with severe AS, or asymptomatic patients with severe AS if they have 1) left ventricular ejection fraction (LVEF) <50%, 2) other planned cardiac surgery, and may be reasonable if they have 3) very severe AS, 4) abnormal exercise testing results, or 5) rapidly aggravating AS.³⁾ However, in the elderly, SAVR is quite often unfeasible due to high surgical risk or socioeconomic conditions, and thus medical treatment or symptomatic treatment was the only practical resort. In fact, nearly half of elderly symptomatic severe AS patients did not undergo SAVR.^{2,4)} The recent emergence of transcatheter aortic valve replacement (TAVR) brought new hopes for AS patients who could not enjoy the benefit of SAVR, and nowadays, TAVR has established its place as an alternative option for high surgical risk or extremely elderly patients. Although the high cost of TAVR compared to that of SAVR is still a barrier in Korea, especially in the elderly who are often in financially difficult situations, the procedure rate of TAVR keeps increasing. AS patients who could not undergo surgical correction for various reasons can now achieve longevity with greater quality of life through TAVR, and thus, the number of AS patients treated medically is expected to decrease. In this respect, the article given by Oh et al.⁵⁾ in this issue of the *Korean Circulation Journal* may seem to be outdated. Notwithstanding, we believe that this article is of value, because no data has hitherto been published regarding the portion of AS patients in Korea being treated medically. With this small, but important data on natural history of AS patients, we can predict the number of TAVR candidates, which can aid planning of national budgets.

Let's briefly go over Oh et al.'s data.⁵⁾ They investigated the survival of severe 'symptomatic' AS patients who refused SAVR. One hundred eighty (mean age 78±7 years, 33.7%) out of 534 patients refused corrective surgery for severe AS, who were followed for 39.1±31.0 months. The authors found that one-year all-cause mortality and cardiac mortality was 21.1±3.0% and 18.0±2.9%, respectively, which was much higher compared to that of normal age- and sex-matched controls from national statistics (1.3±0.4% and 0.2±0.1%, respectively). Three- and 5-year all-cause mortality rates were 43.1±3.8% and 56.5±4.2% in severe AS patients,

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and $11.4 \pm 1.0\%$ and $25.7 \pm 1.4\%$ in the controls; 3- and 5-year cardiac mortality rates were $38.2 \pm 3.8\%$ and $50.7 \pm 4.3\%$ in severe AS patients, and $3.0 \pm 0.6\%$ and $6.4 \pm 0.8\%$ in the controls, respectively. More importantly, cardiac mortality accounted for around 90% of the deaths in severe AS patients, compared to around 25% of the deaths in normal controls. This study found a lower mortality rate than previous studies did: one-year mortality rates ranged from 33.5% in one study of unoperated symptomatic severe AS patients,⁴⁾ 38% in another study of unoperated severe AS patients,⁶⁾ up to 50.7% in inoperable symptomatic severe AS patients in the Placement of Aortic Transcatheter Valves (PARTNER) trial.⁷⁾ One main reason may be that the study by Oh et al.⁵⁾ enrolled the 'younger' elderly AS patients (78 ± 7 years), whereas the mean age of AS patients enrolled in the PARTNER trial was 83.1 ± 8.6 years. Since age itself is one of the most important unmodifiable risk factors of mortality, it seems that the study by Oh et al.⁵⁾ recruited AS patients at a somewhat lower risk. Also, the patients in this study had a lower prevalence of comorbidities compared to other studies. One limitation of this study, as the authors acknowledged, was that 11 patients who were unable to be contacted by the physician were presumed to have died of cardiac causes. This may be one reason why cardiac mortality was unexpectedly high. It would also have been more fruitful and persuasive if outcomes were compared with age- and sex- matched severe AS patients who received SAVR or TAVR; these analyses would have objectively strengthened the rationale for active treatment in severe 'symptomatic' AS patients.

Finally, one issue that is worthy of being mentioned is that this study found no significant differences in all-cause and cardiac mortality among groups stratified by trans-aortic valve pressure gradient and LVEF (i.e., high-gradient severe AS with preserved/depressed LVEF and low-gradient severe AS with preserved/depressed LVEF). Low-gradient severe AS with preserved LVEF is not easy to diagnose, and multimodality imaging approach can be preferable in confirming the role of severe AS in provoking symptoms.⁸⁾ According to data provided by Oh et al.,⁵⁾ all types of symptomatic severe AS resulted in grave prognosis if untreated, and thus, the diseased aortic valve should be replaced in a timely fashion regardless of the pressure gradient or flow type.⁵⁾ However, we also need to remember an earlier report suggesting that the outcome of low-gradient severe AS with preserved LVEF was similar to that of mild to moderate AS and was not favorably affected by SAVR.⁹⁾ This issue requires further investigation in Korean severe AS patients.

Natural history data in severe AS is now difficult to obtain, because there is no doubt that SAVR has been established as a life-saving treatment, and thus, it is unethical not to refer severe symptomatic AS patients to corrective surgery. Besides, TAVR is a reliable plan B in severe AS patients at intermediate or high surgical risk and those who refuse SAVR. In this respect, this study provides a last opportunity to remind us of the importance of timely referral for SAVR or TAVR in severe AS. As there is no doubt that symptomatic severe AS confers a grave prognosis, necessity of corrective AS surgery should again be highlighted. Undoubtedly, less invasive radical treatments such as TAVR or suture-less SAVR are opening a new chapter in the treatment of severe AS. With these new treatment options, we hope that the majority of elderly AS patients can enjoy the benefit of aortic valve replacement in terms of quality of life and longevity.

REFERENCES

1. World Bank. Life expectancy at birth, total (years) [Internet]. Washington, D.C.: World Bank; 2017 [cited 2018 Oct 1]. Available from: <https://data.worldbank.org/indicator/SP.DYN.LE00.IN>.

2. Osnabrugge RL, Mylotte D, Head SJ, et al. Aortic stenosis in the elderly: disease prevalence and number of candidates for transcatheter aortic valve replacement: a meta-analysis and modeling study. *J Am Coll Cardiol* 2013;62:1002-12.
[PUBMED](#) | [CROSSREF](#)
3. Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *Circulation* 2014.129:e521-643.
[PUBMED](#)
4. Bach DS, Siao D, Girard SE, Duvernoy C, McCallister BD Jr, Gualano SK. Evaluation of patients with severe symptomatic aortic stenosis who do not undergo aortic valve replacement: the potential role of subjectively overestimated operative risk. *Circ Cardiovasc Qual Outcomes* 2009;2:533-9.
[PUBMED](#) | [CROSSREF](#)
5. Oh JK, Park JH, Hwang JK, et al. Long-term survival in Korean elderly patients with symptomatic severe aortic stenosis who refused aortic valve replacement. *Korean Circ J* 2019;49:160-9.
[CROSSREF](#)
6. Varadarajan P, Kapoor N, Bansal RC, Pai RG. Clinical profile and natural history of 453 nonsurgically managed patients with severe aortic stenosis. *Ann Thorac Surg* 2006;82:2111-5.
[PUBMED](#) | [CROSSREF](#)
7. 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;363:1597-607.
[PUBMED](#) | [CROSSREF](#)
8. Abudiab MM, Pandit A, Chaliki HP. Role of transesophageal echocardiography in the diagnosis of paradoxical low flow, low gradient severe aortic stenosis. *Korean Circ J* 2017;47:82-8.
[PUBMED](#) | [CROSSREF](#)
9. Tribouilloy C, Rusinaru D, Maréchaux S, et al. Low-gradient, low-flow severe aortic stenosis with preserved left ventricular ejection fraction: characteristics, outcome, and implications for surgery. *J Am Coll Cardiol* 2015;65:55-66.
[PUBMED](#) | [CROSSREF](#)