

EDITORIAL COMMENT

Benefit of Earlier Intervention for Degenerative Mitral Regurgitation in Asian Patients*



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Degenerative (primary) mitral regurgitation (DMR) is a primary disorder of the mitral valve apparatus, including the leaflets, chordae tendineae, papillary muscle, and annulus. The primary cause of DMR is mitral valve leaflet prolapse or flail leaflet with chordae rupture. Because DMR is a mechanical problem, mechanical correction is the only solution. The most recent guidelines recommend surgical mitral valve repair at the Class I level in patients who are symptomatic or asymptomatic patients with left ventricular (LV) systolic dysfunction.^{1,2} Currently, LV ejection fraction $\leq 60\%$ and left ventricular end-systolic diameter (LVESD) ≥ 40 mm indicate the LV systolic dysfunction because prior studies suggest that LV ejection fraction $\leq 60\%$ and LVESD ≥ 40 mm were associated with poor outcomes after mitral valve surgery.^{3,4} Several registries also agreed that an early mitral valve repair approach is preferred to improve the clinical outcomes in these populations.⁵⁻⁷ Although the LV chamber size is a useful surrogate marker for early surgery, Asian patients have smaller bodies and hearts. Therefore, Asian patients may require a different cutoff value for LV size when recommending early mitral valve repair. To better manage patients with DMR, the clinical practice and outcomes of DMR in Asian countries must be understood.

In this issue of *JACC: Asia*, Hamid et al⁸ clarified the difference in presentations, management, and

clinical outcomes of patients with DMR from Asian institutions (AsI) and European-American institutions (EAI). Only the flail leaflet was included as DMR. The AsI patients were recruited from 2 tertiary institutions of Hong Kong and Singapore, whereas the EAI patients were enrolled through the MIDA (Mitral regurgitation International Database) registry. Although the AsI patients had a smaller absolute LV chamber size, their body surface area (BSA)-indexed LV diameter was considerably larger than the EAI patients. This data suggest that imaging underestimates volume overload in Asian populations with DMR owing to their body sizes. This underestimation as well as less symptoms among AsI patients and cultural aspects may facilitate the low incidence of mitral valve interventions (55% vs 77% at 1-year; $P < 0.0001$). Consequently, the low surgical rate had a direct impact on the high mortality rate among the AsI patients (adjusted HR: 1.60 [1.13-2.27]; $P = 0.008$). Importantly, predominance of mitral valve repair among the interventions, survival benefit of early surgery (≤ 3 months after diagnosis), and post-operative mortality after matching the comorbidities were similar in the AsI and EAI patients. Therefore, the main message of this study is that early mitral valve intervention for DMR should also be recommended in Asian patients accounting for the LV chamber corrected by body size to achieve optimal outcomes.

This study raises several unresolved issues regarding the management of DMR in Asian populations. First, although imagings can sometimes mislead patients about the disease severity of DMR in patients with small body sizes, cutoff values as a BSA-indexed LVESD for recommending mitral valve interventions have not been established. A European study found that a BSA-indexed LVESD ≥ 22 mm/m² could predict mortality after the surgery.⁴ Alternatively, the Japanese guidelines for valvular heart disease use a BSA-indexed LVESD ≥ 24 mm/m² to

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recommend mitral valve surgery in patients with a BSA <1.7 m²,⁹ but no evidence exists to support this value. The next step will be to examine patients with DMR worldwide to determine the optimal cutoff value of BSA-indexed LVESD for mitral valve surgery. Furthermore, not only LV chamber size but also DMR severity may be misjudged based on body size. The regurgitant volume calculated from the effective orifice area may have underestimated DMR severity in patients with small body sizes because of the small LV chamber. Therefore, the regurgitant fraction and quantitative approach should be used to comprehensively assess DMR severity in Asian patients. Second, patients were enrolled in this study between 2005 and 2014, which is more than 10 years ago. Therefore, the current DMR practices may not be reflected. This study population was relatively young, with an average age of 63 years, and most of the patients underwent open heart surgery. Currently, a less invasive transcatheter mitral valve intervention has spread worldwide, primarily among the elderly. In the United States, approximately 28.5% of patients with DMR underwent transcatheter edge-to-edge repair, with a mean age of 80.8 years (70.6 years in patients with surgical repair).¹⁰ In Asian countries, the number of transcatheter edge-to-edge repairs is limited due to the insurance system but is gradually increasing. This newer technology may change the treatment pathway of DMR. Based on the

cotemporary management and outcomes of elderly patients with DMR, the efficacy of early surgery and transcatheter repair should be evaluated in further research. Third, this study included the DMR patients with flail leaflet from only 2 institutions in Hong Kong and Singapore. In particular, patients were enrolled in a very limited area in Asia. Although health care systems and economics differ across several Asian countries, future research should include various regions such as Japan, Korea, and China.

In conclusion, Hamid et al⁸ demonstrated that less and delayed mitral intervention affected excess mortality in Asian patients with DMR. BSA-indexed LVESD may be a useful tool for determining disease severity and avoiding delayed intervention. Currently, a less invasive transcatheter approach can be selected, and the benefits of earlier mitral valve intervention should be investigated in various populations with DMR.

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