Disclosures

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Comparative Outcomes of Mitral Valve in Valve Implantation Versus Redo Mitral Valve Replacement for Degenerated Bioprotheses

Structural valve deterioration is the Achilles' heel of surgical bioprotheses.[1] It is estimated that >1/3 of patients receiving mitral valve replacement (MVR) with a bioprosthetic valve require MV re-intervention within 10 years.[2] Although redo-MVR has been the gold-standard strategy for degenerated bioprotheses, transcatheter mitral valve-in-valve (MViV) recently emerged as a feasible alternative to redo-MVR.[3] However, comparative data of the 2 strategies are limited.[4] We sought to compare outcomes of MViV versus redo-MVR using the National Readmission Database.

We used the International Classification of Disease 10th-Clinical Modification codes to identify patients age ≥50 years with structural valve deterioration (T82.01XA, T82.02XA, T82.03XA, T82.09XA, T82.221A, T82.222A, T82.223A, T82.228A, Z45.09, Z95.2, and T82.857) who underwent redo-MVR (02RG07Z, 02RG08Z, 02RG0KZ, and 02RG0JZ) or MViV (02RG37H, 02RG37Z, 02RG38H, 02RG38Z, 02RG3JH, 02RG3JZ, 02RG3KH, and 02RG3KZ) between January 1, 2016 and December 31, 2017. This method has been used in previous studies to identify re-interventions for degenerated bioprotheses.[5] We excluded patients with infective endocarditis, patients with missing mortality data, and those who were transferred to another hospital to avoid duplication. The primary end point was in-hospital mortality. Secondary end points were in-hospital major adverse events (MAEs); a composite of death, vascular complications, acute kidney injury, or stroke; length of stay, cost, and 30-day readmissions.

Descriptive statistics were presented as frequencies with percentages for categorical variables. Medians and interquartile ranges (IQR) were reported for continuous variables. To account for differences in baseline characteristic, a nearest neighbor 1:3 variable ratio, parallel, balanced propensity-score matching model with a caliper of 0.01 was applied. Furthermore, we performed a sensitivity analysis by excluding patients who underwent concomitant valve surgery. Statistical analyses were performed using statistical package for social science (SPSS) version 26 (IBM Corp).

A total of 1,788 patients (MViV = 384; MVR = 1,404) were included in the current analysis. Patients who underwent MViV were older (76 years [IQR 68 to 82] vs 68 years [IQR 61 to 75], p <0.01) and had higher comorbidity burden (Table 1). After propensity-score matching, in-hospital mortality and MAEs were lower in the MViV group (5.3% vs 11.9%, p <0.01), and (25.8% vs 44.1%, p <0.01), respectively. Length of stay was shorter, and cost was less in the MViV group. However, 30-day readmissions were similar in the 2 groups (Table 1). In the sensitivity analysis, MViV remained associated with lower incidence of adjusted in-hospital mortality, but this did not achieve statistical significance (4.8% vs 8.0%, p = 0.06). However, adjusted MAEs continued to be significantly less with MViV (25.6% vs 40.0%, p <0.01).

This study suggests that MViV for degenerated mitral surgical valves is associated with favorable short-term outcomes and resource utilization compared with redo-MVR. The results of this study need to be interpreted in the context of the known limitations of administrative databases which include: the potential for under- or over-coding; the lack of echocardiographic, hemodynamic, or angiographic information or details on surgical techniques; the limited ability to account for selection bias, and the lack of long-term follow-up data. Nonetheless, considering the low likelihood of randomized comparative data of MViV versus redo-MVR, this real-world observational study provides reassuring evidence supporting the short-term safety and cost-effectiveness of MViV as a primary strategy in selected patients with degenerated mitral bioprostheses.

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Table 1
Characteristic and outcomes of MViV versus MVR

Characteristics/outcomes	Unmatched cohort			Propensity-matched cohort		
	MViV (n = 384)	MVR (n = 1,404)	p value	MViV (n = 361)	MVR (n = 807)	p value
Age, Median (25th to 75th IQR)	76 (68-82)	68 (61-75)	<0.01	75 (67-82)	73 (66-78)	<0.01
Female	56%	54.8%	0.67	56%	55%	0.76
Diabetes mellitus	34.6%	38.7%	0.14	34.9%	37.1%	0.48
Hypertension	57.3%	41.4%	<0.01	57.1%	50.9%	0.05
Peripheral vascular disease	9.2%	9.1%	0.75	9.4%	9.2%	0.89
Chronic anemia	31%	22.2%	<0.01	29.9%	25.8%	0.14
Chronic heart failure	85.9%	64.1%	<0.01	85%	80.4%	0.06
Coronary artery disease	53.9%	46.8%	0.01	52.4%	51.4%	0.76
Chronic kidney disease	40.9%	35.6%	<0.01	38.8%	34%	0.11
Atrial fibrillation	65.9%	72.1%	0.01	67%	68.8%	0.55
Conduction abnormality	5.2%	6.3%	0.44	5.5%	5.2%	0.81
Prior defibrillator	8.1%	4.4%	<0.01	6.1%	5.8%	0.85
Chronic liver disease	6.8%	6.8%	0.96	6.9%	7.1%	0.93
Clinical outcomes						
Major adverse events	25.8%	38.7%	<0.01	25.8%	44.1%	<0.01
Death	5.5%	9.5%	0.01	5.3%	11.9%	<0.01
Vascular complications	3.9%	5.9%	0.12	3.9%	6.4%	0.07
Acute kidney Injury	21.1%	32.3%	<0.01	21.3%	35.6%	<0.01
Stroke	1.0%	1.1%	0.36	1.1%	1.4%	0.72
Blood transfusion	15.9%	34.8%	<0.01	15.2%	37.4%	<0.01
Length of hospitalization median days (25th to 75th IQR)	5 (2-11)	11 (7-18)	<0.01	5 (2-11)	11 (7-17)	<0.01
Cost of hospitalization median $ (25th to 75th IQR)	60,670 (45,188-83,070)	67,232 (46,911-97,277)	<0.01	59,790 (44,255-82,430)	68,421 (47,742-99,861)	<0.01
30-day readmission rate	14.7%	14.9%	0.95	14.7%	14.4%	0.92

MViV = mitral valve in valve; MVR = redo-mitral valve replacement, IQR = the interquartile range; $ = US dollar.

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Less Myocardial Infarction and Stroke Hospitalizations During Middle East Respiratory Syndrome Coronavirus Epidemic in Korea

Viral infections are known to impact coronary disease, and acute myocardial infarction (AMI) may be triggered by the inflammatory cytokine response to infection.[1,2] Cytokines promote local inflammation in atherosclerotic plaques within the coronary artery, which can lead to plaque destabilization, rupture, and eventually AMI development. Psychological adversity, depression, stress at home or work, social isolation, and loneliness are also known factors contributing to acute vascular event.[3] Recent outbreaks of coronavirus (CoV), including severe acute respiratory syndrome, and Middle East respiratory syndrome (MERS) have been associated with a increase in patients presenting with cardiovascular complications in several countries.[4] Here, we explored the prevalence of AMI-, and acute stroke hospitalization during 2015 MERS-CoV epidemic in Korea.

This retrospective observational study analyzed data from the Korean general patient population from 1 January 2014 to 31 December 2016. Each case of AMI and stroke was validated using codes I210 to I219 and I60 to I64 in accordance with the Korean Standard Classification of Diseases. AMI and stroke-related hospitalization cases were identified in the National Emergency Department Information System (NEDIS) database. In total, 185 reports of patients infected with the MERS-CoV were recorded between 20 May and 4 July 2015 (over 46-day period) in