



Prognostic factors for long-term mortality in left-sided infective endocarditis after surgical treatment

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Background

- Infective endocarditis is not a prevalent disease but has a high mortality rate.
- Especially left-sided infective endocarditis (LSIE) shows a higher mortality rate than right-sided infective endocarditis.
- Surgical treatment is occasionally considered for LSIE, but not much data is available on the long-term prognostic factors for LSIE after surgical treatment.

Objectives

- To investigate the risk factors for long-term mortality in LSIE patients who underwent surgical treatment.

Methods

- This retrospective study enrolled adult patients with LSIE admitted to Severance Hospital in South Korea and underwent surgical treatment from November 2005 to August 2017.
- The primary outcome was overall all-cause mortality.
- Multivariate Cox regression analyses were performed to assess the risk factors for long-term mortality of LSIE with surgical treatment.

Results

Table 1. Characteristics of surgically treated LSIE patients

	Survival (n=205)	Death (n=34)	P value
Age	51.0 [39.0;61.0]	61.0 [53.0;72.0]	0.001
Male sex	141 (68.8%)	26 (76.5%)	0.482
Community-acquired	187 (91.2%)	29 (85.3%)	0.441
Valve status			
Native	183 (89.3%)	28 (82.4%)	0.382
Involved valve			
Isolated aortic	57 (27.8%)	14 (41.2%)	0.168
Isolated mitral	108 (52.7%)	10 (29.4%)	0.020
Bivalvular	40 (19.5%)	10 (29.4%)	0.277
Comorbidities			
Predisposing valve condition	79 (38.5%)	17 (50.0%)	0.283
Patients with previous valve surgery or prosthesis	28 (13.7%)	8 (23.5%)	0.218
Diabetes mellitus	30 (14.6%)	8 (23.5%)	0.289
Chronic heart failure	8 (3.9%)	3 (8.8%)	0.194
Chronic Renal disease	8 (3.9%)	6 (17.6%)	0.007
Chronic Liver disease	7 (3.4%)	5 (14.7%)	0.017
Charlson comorbidity index	1.0 [0.0;3.0]	3.0 [1.0;5.0]	0.001
Pathogen			0.147
MSSA	9 (4.4%)	3 (8.8%)	
MRSA	3 (1.5%)	2 (5.9%)	
Streptococcus	94 (45.9%)	9 (26.5%)	
Enterococcus	14 (6.8%)	4 (11.8%)	
Other	24 (11.7%)	6 (17.6%)	
Unknown	61 (29.8%)	10 (29.4%)	
Platelet	231.0 [170.0;319.0]	158.5 [85.0;243.0]	0.001
Blood urea nitrogen	13.9 [10.6;19.2]	20.6 [13.7;33.5]	0.001
Creatinine	0.9 [0.7;1.1]	1.1 [0.9;1.5]	0.001
Total bilirubin	0.6 [0.4;0.8]	0.8 [0.5;1.3]	0.026
SOFA score	1.0 [1.0;2.0]	2.0 [1.0;4.0]	0.014
Cerebral embolism	55 (26.8%)	20 (58.8%)	<0.001
Time to surgery after admission	8.0 [4.0;15.0]	8.5 [5.0;20.0]	0.325
Euroscore II	1.9 [1.5;2.8]	2.4 [2.1;5.1]	0.001
Antibiotics days	31.0 [26.0;41.0]	36.5 [22.0;45.0]	0.987

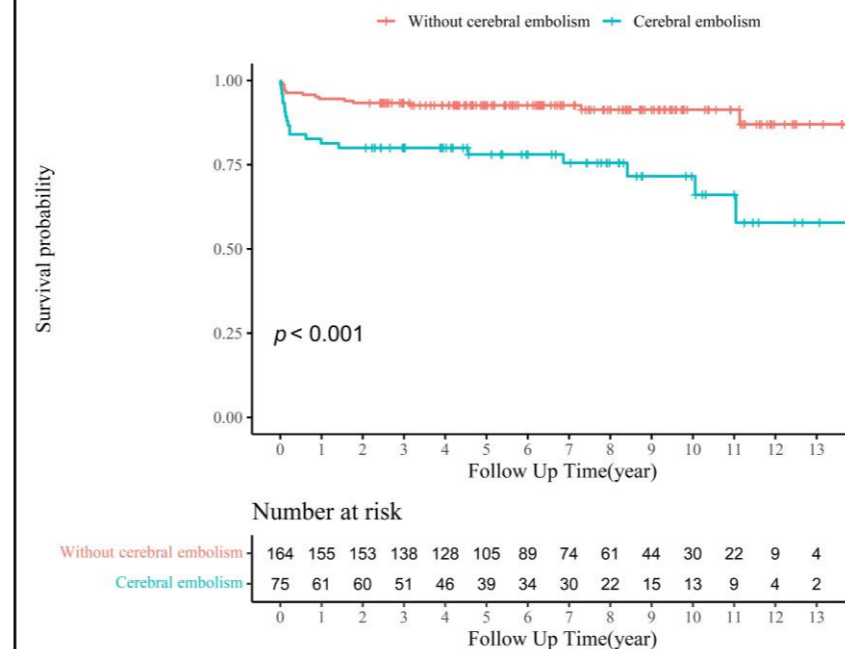
LSIE, left-sided infective endocarditis; MSSA, methicillin-susceptible Staphylococcus aureus; MRSA, methicillin-resistant Staphylococcus aureus

Table 2. Cox regression analysis for long-term mortality

	Univariate analysis		Multivariate analysis	
	Hazard ratio (95% CI)	P value	Hazard ratio (95% CI)	P value
Cerebral embolism	3.48 (1.76-6.9)	<0.001	3.62 (1.79-7.31)	<0.001
Chronic liver disease	5.01 (1.89-13.2)	0.001	4.24 (1.53-11.76)	0.005
Age	1.04 (1.02-1.07)	0.001	1.03 (1.00-1.06)	0.021
Isolated Mitral valve involvement	0.40 (0.19-0.83)	0.014	0.48 (0.22-1.05)	0.066
SOFA score	1.36 (1.16-1.59)	<0.001	1.15 (0.93-1.42)	0.197
Chronic kidney Disease	13.7 (6.67-28.2)	0.001	1.44 (0.46-4.58)	0.532

CI, Confidence interval; SOFA, Sequential Organ Failure Assessment

Figure 1. Kaplan-Meier survival curve for overall mortality



Major Findings

- The median follow-up period was 6.2 years, and there were 34 deaths (14.2%) during the period.
- The mortality group showed older age (61.0 [53.0-72.0] vs 51.0 [39.0-61.0] years, P = 0.001), more chronic kidney disease (17.6% vs 3.9%, P = 0.007), more chronic liver disease (CLD) (14.7% vs 3.4%, P = 0.017), more cerebral embolisms (58.8% vs 26.8%, P < 0.001), less isolated mitral valve involvement (29.4% vs 52.7%, P = 0.020), and higher Sequential Organ Failure Assessment score (2.0 [1.0-4.0] vs 1.0 [1.0-2.0], P = 0.014).
- Multivariate Cox analyses demonstrated cerebral embolism (Hazard ratio (HR): 3.62, 95% Confidence Interval (CI): 1.79-7.31, P < 0.001), CLD (HR: 4.24, CI: 1.53-11.76, P = 0.005), and age (HR: 1.03, CI: 1.00-1.06, per 1 year, P = 0.021) as risk factors for overall mortality.
- Kaplan-Meier survival curve showed significant difference between the patients with and without cerebral embolism (P < 0.001, log-rank).

Conclusions

- Cerebral embolism, CLD, and older age were associated with the long-term mortality in LSIE patients who underwent surgery.
- Preventive strategies for cerebral embolism are essential for the improvement in LSIE treatment.