



Prognostic factors for heart valve surgery outcomes in Dr Sardjito General Hospital Yogyakarta, Indonesia

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ABSTRACT

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Heart valve disease is a serious health problem due its significant effect on mortality. Surgical intervention plays an important role in the management of moderate to the severe valvular heart disease. The evaluation of the patient outcomes has been widely accepted as one of the important steps to improve the quality of patient care. Recognition of post operative complications might significantly affect the patient quality of life. Therefore, the identification of prognostic factors and morbidity of heart surgery patients can provide valuable insights on improving the quality of patient care. This study aimed to investigate the prognostic factors for heart valve surgery outcomes in Dr. Sardjito General Hospital, Yogyakarta, Indonesia. This study was conducted using data of patient's medical records who underwent heart valve surgery included morbidities and their prognostic factors. The data were analyzed using Chi-square test and logistic regression with significance level of 0.05. During 2010 to 2014, 82 patients underwent heart valve surgeries at the hospital. The kidney disorders and heart failure were significantly associated with the patient morbidity ($p < 0.05$), while the gender, pulmonary disease, angina, and impaired ventricular function were not ($p > 0.05$). Multivariate analysis showed that the heart failure is the most significant factor of morbidity. The risk of New York Heart Association (NYHA) class 3 patients were 7.18 times compared with NYHA class 2 patients. In conclusion, the heart failure is the most significant factor for the morbidity of heart valve surgery followed by the kidney disorders at the Dr. Sardjito General Hospital.

ABSTRAK

Penyakit katup jantung merupakan masalah kesehatan yang serius karena efeknya nyata terhadap timbulnya kematian. Pembedahan merupakan tindakan penting dalam pengelolaan penyakit katup jantung sedang sampai berat. Evaluasi terhadap kondisi pasien setelah tindakan telah diterima secara luas sebagai salah satu langkah penting untuk meningkatkan kualitas perawatan pasien. Mengenal komplikasi pasca operasi kemungkinan berpengaruh nyata terhadap kualitas hidup pasien. Oleh karena itu, identifikasi faktor prognosis dan mortalitas pasien bedah jantung dapat memberi arti penting dalam meningkatkan kualitas perawatan pasien. Penelitian ini bertujuan untuk mengetahui faktor prognostic untuk hasil operasi katup jantung di Rumah Sakit Umum Pusat (RSUP) Dr. Sardjito Yogyakarta, Indonesia. Penelitian menggunakan data rekam medis pasien yang menjalani bedah katup jantung termasuk data faktor morbiditas dan prognosinya. Selanjutnya, data dianalisis dengan menggunakan uji Chi-square dan regresi logistic dengan tingkat signifikansi 0,05. Selama tahun 2010 sampai 2014, 82 pasien menjalani bedah katup jantung di rumah sakit tersebut. Gangguan ginjal dan gagal jantung secara signifikan terkait dengan morbiditas pasien ($p < 0,05$), sedangkan jenis kelamin, penyakit paru-paru, angina, dan gangguan fungsi ventrikel tidak ($p > 0,05$). Analisis multivariat menunjukkan bahwa gagal jantung adalah faktor yang paling signifikan mempengaruhi morbiditas. Risiko pasien kelas 3 NYHA (*New York Heart Association*) adalah 7,18 kali dibandingkan dengan pasien kelas 2 NYHA. Dapat disimpulkan, gagal jantung merupakan faktor prognosis paling signifikan diikuti gangguan ginjal di RSUP Dr. Sardjito, Yogyakarta.

Keywords:
heart valve surgery
morbidity
prognostic factors
outcome

INTRODUCTION

The valvular heart disease (VHD) is a serious health problem due to significantly impact on mortality.¹ Surgical intervention is key to success in management of moderate to severe VHD.² The evaluation of the patients outcomes has been widely accepted as one of the important steps to improve the quality of patient care. Although postoperative mortality is the most important outcome, mortality alone is not sufficient for the assessment of patient outcomes. Recognition of post operative complications might significantly affect the patient quality of life. Therefore, the identification of prognostic factors and morbidity of heart surgery patients can provide valuable insights on improving the quality of patient care.³ The morbidity post heart valve surgery are showed as follow 1) permanent stroke, 2) acute renal failure, 3) elongation use of ventilators >24h, 4) infection in the sterna wound hearth failure, 5) elongation ICU care (> 6 days), 6) re-operation for all reasons.⁴

Prognostic factors for morbidities post cardiac surgery have been reported in some studies.⁵ European system for cardiac operative risk evaluation (EuroSCORE) and revised by EuroSCORE II is a model to predict the risk of heart disease mortality after cardiac surgery. It is the most widely used to calculate the risks of surgery and proved as good predictors for postoperative morbidity in heart surgery. In the EuroSCORE II uses 18 factors to calculate the risk of cardiac surgery, which are divided into patient factors, cardiac factors, and surgery factors.⁶

In this study, we investigated eight factors for morbidities post cardiac surgery among patients who underwent the heart valve surgery at the Dr. Sardjito General Hospital, Yogyakarta. Eight factors for morbidities according

to EuroSCORE II as 1) age, 2) gender, 3) kidney disorder, 4) chronic lung disease, 5) hearth failure, 6) angina CCS 4, 7) left ventricle dysfunction, and 8) recent myocardial infarct have been investigated.

MATERIALS AND METHODS

Patients

This was a retrospective cohort study involving the patients who underwent heart valve surgery at the Dr. Sardjito General Hospital, Yogyakarta, Indonesia, from January 1st, 2010 to December 31st, 2014 and met the inclusion and exclusion criteria. The inclusion criteria were patient's medical record consist of studied research variables and patient underwent heart valve surgery in the hospital. The patients having incomplete data were excluded in this study.

Protocol of study

Eighty patients who met the inclusion and exclusion criteria were involved in this study. The research dependent variables according to EuroSCORE II such as age, gender; kidney disorder, chronic lung disease, hearth failure, angina CCS 4, left ventricle dysfunction, and recent myocardial infarct and the research independent variable i.e. morbidity were gathered from patient's medical record. The protocol of the study has been approved by the Medical and Health Research Ethics Committee, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta.

Statistical analysis

Data were presented as frequency or percentage and were analyzed using Chi-square test and logistic regression. A p value <0.05 as considered significant.

RESULTS

The characteristic patients who underwent the heart valve surgery involving in this study is shown in TABLE 1. The patients consisted of 33 (40.24%) male and 49 (59.76%) female, aged between 17 years and 67 years (37.03 ± 11.44 years). The mortality rate was 15.85% (13 patients).

TABLE 1. Baseline characteristic patients.

Variable	n	%
Age		
• <60 yo	79	96.34
• ≥ 60 yo	3	3.66
Gender		
• Female	49	59.76
• Male	33	40.24
Kidney disorders		
• Yes	51	62.20
• No	31	37.80
Lung disease		
• Yes	3	3.66
• No	79	96.34
Heart failure		
• NYHA 1	0	0
• NYHA 2	55	67.07
• NYHA 3	26	31.71
• NYHA 4	0	0
Angina		
• Yes	6	7.32
• No	76	92.68
Impairment of ventricular function		
• Yes	6	7.32
• No	76	92.68
Recent myocardial infarct		
• Yes	0	0
• No	82	100

The association between prognostic factors and morbidity is shown in TABLE 2. Among 82 patients, the morbidity was

found in 30 patients (43.48%), 18 patients (26.09%) were on ventilator > 24 hours post-operatively, 2 patients (2.90%) had a post-operative stroke, 2 patients (2.90%) were in the ICU for > 6 days, 1 patient (1.45%) had post-operative renal failure, and 1 patient (1.45%) underwent re-operation.

TABLE 2. The association between prognostic factors and morbidity.

Variable	Morbidity		p
	Yes	No	
Age			
• <60 yo	41	38	1.000
• ≥ 60 yo	2	1	
Gender			
• Female	26	23	0.891
• Male	17	16	
Kidney Disorder			
• Yes	32	20	0.030
• No	11	19	
Chronic lungs disease			
• Yes	3	0	0.243
• No	40	39	
Heart failure			
• NYHA 2	22	34	0.001
• NYHA 3	21	5	
Angina CCS 4			
• Yes	3	3	1.000
• No	40	36	
Impairment of left ventricle function			
• Yes	5	1	0.205
• No	38	38	
Recent myocardial infarct			
• Yes	0	0	-
• No	43	39	

Bivariate analysis showed that the kidney disorders and heart failure are significantly associated with morbidity ($p < 0.05$), while age, gender, lung disease,

angina, and impaired left ventricular function are not ($p>0.05$). Logistic regression revealed that the heart failure

is the most significant factor affected the morbidity with an OR of 7.187 (95% CI 2.24-23.065; $p=0.001$) (TABLE 3).

TABLE 3. Multiple logistic regression analysis

Variable	p	OR	95% CI
Kidney disorders (positive/negative)	0.028	3.200	1.134–9.027
Heart failure (NYHA 3/NYHA 2)	0.001	7.187	2.240–23.065

DISCUSSION

The mortality rate in this study (15.85%) was higher than those previous study.⁷ Furthermore, the morbidity was similar with another study.⁸ This study showed that the gender is not related to the morbidity. It was different from the previous study.⁹ Mortality and morbidity of surgery might increase with older patients undergoing surgery.¹⁰ However, in this study, the age of patients did not have a significant impact on morbidity. It might be due to the number of studies were too small. Preoperative kidney disorder (renal impairment) was defined as creatinine clearance numbers <80 mL/min. In this study, preoperative kidney disorder (renal function impairment) increases the risk of postoperative morbidity significantly. It was related to longer ventilator use, length of stay in ICU and longer hospital stay. Perioperative management with careful selection of therapeutic strategies is useful to improve the surgical outcomes.¹¹ Criteria for heart failure using preoperative criteria by New York heart association (NYHA), criteria based on the patient's clinical symptoms. In this study, NYHA class 3 patients had higher risk for morbidity compared with NYHA class 2 patients. The recent myocardial infarct (MI) was not analyzed since no patients with MI in this study.

CONCLUSION

In conclusion, the heart failure is the most significant factor for the morbidity of heart valve surgery followed by the kidney disorders at the Dr. Sardjito General Hospital, Yogyakarta, Indonesia.

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