Factors associated with in-hospital mortality among infective endocarditis patients

Yik Hon Ho, MRCP[1], Caryn Tsujean Lim, MRCP[1], Chelfi Zhi Fei Chua, BPharm (UQ)[1], Han Bing Chow, MRCP[2], Hock Hin Chua, FRCP[3], Alan Yean Yip Fong, FRCP[1]

[1]Department of Cardiology, Sarawak Heart Centre, Kota Samarahan, Sarawak, Malaysia, [2]Department of Medicine, Faculty of Medicine and Health Sciences, University of Malaysia Sarawak, Kota Samarahan, Sarawak, Malaysia, [3]Infectious Disease Unit, Department of Medicine, Sarawak General Hospital, Kuching, Sarawak, Malaysia

ABSTRACT

Introduction: Despite recent advancements in the diagnosis and management of infective endocarditis (IE), it is associated with substantial morbidity and mortality. Our study objective is to determine the factors associated with in-hospital mortality in IE patients among the local population.

Materials and Methods: All IE patients who were diagnosed with definite or possible IE and were treated at Sarawak Heart Centre from 1st January 2020 to 31st December 2022 were recruited. We examined the demographic features of the subjects and the factors that contributed to in-hospital mortality. Multivariate logistic regression was used to analyse the associated factors and in-hospital mortality.

Results: Our study population comprised a total of 37 patients with a mean age of 46.4 years and male predominance. The in-hospital mortality rate of IE in this study was 44.4%. Haemodynamic instability and anaemia were found to be strong predictors of IE survival outcome, with an odds ratio of 51.5 and 35.7 respectively. Patients with vascular phenomenon and heart failure were at 10.5- and 6.0-times higher odds of dying, however, these two associations were found to be not statistically significant.

Conclusion: The in-hospital mortality due to IE in our study was among the highest in developing countries. Factors of hypotension and optimal response to individual hemodynamic parameters may confer lower mortality. While anaemia is demonstrable as a risk factor for inpatient mortality, a target has yet to be reasonably established.

INTRODUCTION

There has been significant progress and improvements in the diagnosis as well as medical and surgical management of infective endocarditis (IE) in the last decade. Yet, it could result in fatal outcomes and is also characterised by substantial morbidity and mortality.[1,2] A systematic review involving 19 studies in developing countries showed mortality rates ranging from 7-46%.[3] Another study in Malaysia conducted by Sunil et al., reported a high in-hospital mortality rate of 35.7% and a complication rate as high as 85.7%.[4] Nevertheless, there is a dearth of research on IE in low- and middle-income (LMIC) countries.[3]

In developing countries, IE is a disease of male predominance.[5,6] Predisposing factors of IE and factors associated with mortality among IE patients are important in the management and prevention of IE. Many factors were found to increase predisposition to IE, which includes rheumatic heart disease, congenital heart disease, valvulopathy or previous valve replacement, and immunosuppressive state.[3,7-9] In addition, predictors of mortality in IE have been explored in previous research. A study done by Collonnaz et al., showed that prognostic factors of 3-month mortality include age ≥70 years, Charlson comorbidity index ≥2, Staphylococcal IE, septic shock, cerebral embolism, and serum creatinine level ≥18μmol/l; while prognostic factors of 1-year mortality include age ≥70 years, Charlson comorbidity index ≥2*time, high blood pressure*time, Staphylococcal IE, septic shock, cerebral embolism, and serum creatinine level ≥180μmol/l.[10] Among intravenous drug users who presented with a first episode of IE, surgery and referral to addiction treatment were associated with lower mortality while left-sided infection and bilateral involvement were associated with higher mortality.[11]

The primary objective of our study is to determine the factors associated with in-hospital mortality in IE patients among the local population. Hopefully, this will allow more focus on the delivery of care for these at-risk groups to improve the treatment outcome.

MATERIALS AND METHODS
Study Design and Setting
A descriptive study was conducted at the Department of Cardiology in the Sarawak Heart Centre (SHC), which is a tertiary cardiac centre located in an urban setting. This study design was selected to describe the factors that were associated with in-hospital mortality.

Participants
Participants consisted of patients who were diagnosed with IE and were treated at the Department of Cardiology, SHC from 1st January 2020 to 31st December 2022. Included were patients who were diagnosed with definite or possible IE using the Modified Duke's Criteria.[7] Excluded were patients