Cardiac performance by echocardiography, cardiovascular biomarker, kidney function, and venous oxygen saturation as mortality predictors of septic shock

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Abstrak

Background: cardiac function in patients with septic shock at the cellular level can be assessed by measuring troponin I and NT Pro BNP levels. Venous oxygen saturation is measured to evaluate oxygen delivery and uptake by organ tissue. Our study may provide greater knowledge and understanding on pathophysiology of cardiovascular disorder in patients with septic shock. This study aimed to evaluate the roles of echocardiography, cardiovascular biomarkers, venous oxygen saturation and renal function as predictors of mortality rate in patients with septic shock.

Methods: this is a prospective cohort study in patients with infections, hypotension (MAP < 65 mmHg) and serum lactate level of > 2 mmol/L. On the first and fifth days, septic patients underwent echocardiography and blood tests. Statistical analysis used in our study included t-test or Mann-Whitney test for numeric data and chi-square test for nominal data of two-variable groups; while for multivariate analysis, we used Cox Regression model.

Results: on 10 days of observation, we found 64 (58%) patients died and 47 (42%) patients survived. The mean age of patients was 48 (SD 18) years. Patients with abnormal left ventricular ejection fraction (LVEF) had 1.6 times greater risk of mortality than those with normal LVEF (RR 1.6; p = 0.034). Patients with abnormal troponin I level showed higher risk of mortality as many as 1.6 times (RR: 1.6; p = 0.004). Patients with impaired renal function had 1.5 times risk of mortality (RR 1.5; p = 0.024). Patients with abnormal troponin I level and/or impaired renal function showed increased mortality risk; however, those with normal troponin I level and impaired renal function also showed increased mortality risk. Multivariate analysis revealed that left ventricular ejection fraction and troponin I level may serve as predictors of mortality in patients with septic shock. (HR 1.99; 95% CI: 1.099 - 3.956 ; p = 0.047 and HR: 1.83 ; 95%CI: 1.049 - 3,215 ; p = 0.043). Conclusion: left ventricular ejection fraction and biomarkers such as troponin I level are predictors of mortality in septic shock patients.