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In-hospital outcome of patients with infective endocarditis: is echocardiography enough?

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Background: Despite improvements in medical and surgical therapy, infective endocarditis (IE) remains a deadly disease. Echocardiography is the first-line diagnostic tool. However, data regarding its role in the prognostic assessment of in-hospital clinical outcome of IE are scarce.

Purpose: We sought to assess the role of echocardiography to predict the in-hospital outcome in a large cohort of patients diagnosed with definite IE and its association with clinical presentation and microorganisms.

Methods: We retrospectively included patients from two centers between 2006 and 2018. Transthoracic and transesophageal echocardiography were performed in all patients. The clinical endpoints were in-hospital death, embolic events (cerebrovascular and non-cerebrovascular), shock (septic shock and cardiogenic shock) and cardiac surgery.

Results: 183 patients with definite IE (age 68.9 ± 14.2 years old, 68.9% male) were evaluated. Ninety three (50.8%) patients had aortic valve IE and 81 (44.3%) patients presented with mitral valve IE. Twenty three patients had multivalvular IE. The in-hospital mortality rate was 22.4%. Sixty patients (32.8%) had embolic events and 42 (23%) patients developed shock during hospitalization. Surgery was performed in 103 (56.3%) patients. Mitral valve IE on echocardiography was an independent predictor of in-hospital mortality ($p = 0.038$, OR 0.38, 95% CI 0.15 – 0.94) and aortic valve IE on echocardiography was an independent predictor of embolic events ($p = 0.018$, OR 0.36, 95% CI 0.16-0.84). The presence of a new cardiac murmur upon admission was predictive for the need of cardiac surgery ($p = 0.042$, OR 0.51, 95% CI 0.22-1.09) and correlated with the severity of valvular regurgitation identified by echocardiography ($p = 0.024$). Methicillin resistant *Staphylococcus aureus* (MRSA) as the causative microorganism was an independent predictor for in-hospital mortality and for the development of shock during hospitalization ($p = 0.010$, OR 0.13 95% CI 0.30 - 0.62 and $p = 0.027$, OR 6.11, 95% CI 1.22 – 30.37, respectively). No correlation was found between MRSA and echocardiographic parameters.

Conclusion: Mitral valve IE was an independent predictor of in-hospital mortality. Furthermore, aortic valve IE was an independent predictor of embolic events. The presence of a new cardiac murmur was predictive for the need of cardiac surgery and correlated with the severity of valvular regurgitation by echocardiography. Our findings suggest that a thorough physical examination upon admission is required in combination with a comprehensive echocardiographic exam for early identification of patients with IE at high-risk for in-hospital death and complications.