

Title: Clinical Outcomes and Predictors of Improved Left Ventricular Ejection Fraction in Heart Failure with Reduced Ejection Fraction due to Non-Ischemic Cardiomyopathy

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Abstract

Background: Left ventricular ejection fraction (LVEF) improvement is the cornerstone of LV reverse remodelling. It prognosticates heart failure with reduced ejection fraction (HFrEF). There is limited data on the clinical factors that predict LVEF improvement among non-ischemic cardiomyopathy (NICM) patients in Malaysia.

Objective: To determine the 3-year outcomes and predictors of LVEF improvement in patients with (NICM) and HFrEF.

Materials & Methods: We recruited patients with NICM and HFrEF (LVEF \leq 40%) between 2016 and 2018. NICM was defined as HF with 1) normal coronary arteries or 2) any coronary artery stenosis not involving the proximal left anterior descending artery (LAD) and without transmural fibrosis in the LAD territory from cardiac magnetic resonance (CMR) imaging to account for the impaired LVEF. Clinical and imaging parameters were assessed using logistic regression statistics to determine the predictors of LVEF improvement. LVEF improvement is defined as a recovery of EF to \geq 40% with at least a 10-point increment from baseline. The clinical outcomes at three year were 1) change in NYHA class and 2) composite of all-cause mortality, unscheduled clinic or emergency department visits, readmission and/or ventricular arrhythmia.

Results: 43 patients were recruited. The mean duration of follow-up and echocardiographic assessment interval were 46 and 23 months, respectively. The cohort had a mean age of 46 ± 13 years, and were mostly male (72%). More patients had NYHA 1 at the end of the study (37% vs 86%). 11 patients (25%) recorded composite outcomes. 62.8% had LVEF improvement. Patients with LVEF improvement had a lower incidence of late gadolinium enhancement (51.7% vs

85.7%, odds 5.6, $p=0.045$) and midwall fibrosis on CMR (18.5% vs 62.5%, odds 7.3, $p=0.003$). LVEF improvement did not affect the functional NYHA recovery (92% vs 81%, $p=0.28$). Patients with less LVEF improvement had higher incidence of composite outcome (18.5% vs 37.5%, $p=0.168$). Other characteristics were not significantly different between the groups.

Conclusion: Patients with NICM and LVEF improvement had lower composite outcome. Absence of late gadolinium enhancement, particularly midwall fibrosis was an independent predictor of LVEF improvement. This underscores the importance of CMR tissue characterisation to refine the prognostication of NICM patients.