Associated factors and clinical implications of dynamic changes in late gadolinium enhancement after acute myocarditis

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Background: Although follow-up cardiac magnetic resonance (CMR) is often performed after acute myocarditis (AM), the prognostic implications of dynamic changes in late gadolinium enhancement (LGE) are unknown.

Purposes: To determine the prognostic implications of dynamic LGE changes after acute AM.

Methods: In a two-centre study, 204 consecutive hemodynamically stable patients (mean age 35±16 years, 78.9% males) with a CMR-based diagnosis of AM were included and underwent repeat CMR 3-12 months after diagnosis. Quantitative LGE was expressed as percent of left ventricular (LV) myocardium. The primary endpoint was the occurrence of major adverse cardiac events (MACE) at median 7.3[IQR:5.7-8.7] years.

Results: Compared to index CMR, there was an increase in LV ejection fraction (EF) (59% vs. 55%,p<0.001) and a decrease in LGE extent (7.6% vs. 12.0%,p<0.001) at follow-up (mean 5.7±2.6 months after index CMR). LGE persisted in 175 patients at follow-up (85.8%). LGE decreased by ≥50% from baseline in 94 patients (46%), by <50% in 86(42%) and increased in 24(12%). Female gender (OR[95%CI]=3.27[1.17-9.12],p=0.023), low baseline LVEF (OR[95%CI]=0.93[0.88-0.98] per %,p=0.010) and LGE involving both septal and lateral walls (OR[95%CI]=4.64[1.77-12.17],p=0.002) were independently associated with increased LGE. By multivariate Cox analysis, only acute heart failure at inclusion (HR[95%CI]=3.11[1.02-9.20],p=0.044), baseline LVEF (HR[95%CI]=0.95[0.89-0.99] per %,p=0.028), a <50% LGE decrease (HR[95%CI]=2.17[1.23-3.88],p=0.021) and an increase in LGE (HR[95%CI]=4.12[1.47-11.52],p=0.004) were significantly associated with MACE.

Conclusion: After AM, LGE persists at 6 months in the vast majority of patients but tends to decrease. A <50% decrease or an increase in LGE are associated with MACE, indicating that follow-up CMR is relevant for risk stratification.

SUMMARY OF THE STUDY