Association of Myocardial Scar Burden Identified by MRI and Left Ventricle Ejection Fraction (LVEF) in Patients with Ischemic Heart Disease (IHD), A Retrospective Cohort Study

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BACKGROUND
Cardiovascular magnetic resonance imaging-late gadolinium enhancement (CMR-LGE) has the ability to identify myocardial scar. We aim to explore the association between scar burden (extent and severity) and follow-up LVEF.

MATERIALS AND METHODS
We studied 159 patients (88.1% men) with IHD who underwent LGE-CMR for LV viability assessment at KAMC-Makkah from 2012 to present. Scar (defined as myocardium with a signal intensity 50% of the maximum in scar tissue). LGE assess semiquantitively A five-point scale system that will be used to describe the transmural extent of LGE in each segment (scar score): 0=no LGE, 1=1%–25%LGE, 2=26%–50%LGE, 3=51%–75%, and 4=76%–100%. Baseline EF (<6 month before CMR) and follow-up EF (>1 month after CMR) was determined by Echocardiography.

RESULTS
The mean age was 57.24±9.99 years and the mean baseline LVEF was 28.3±10.5. Mean scar percentage and transmurality score were higher in patients with severely and moderately depressed baseline LVEF compared to mild to normal LVEF. (38.37±20.7 and 39.06±16.84 vs. 18.46±19.53, p<0.001, and 8.28±4.91 and 8.65±4.26 vs. 4.16±15.12, p=0.003), respectively. On linear regression, baseline EF and scar score% significantly predicted follow-up EF, (b=0.535, p<0.001 and b=-0.102, p=0.024), respectively. Baseline EF and Left Anterior Descending artery (LAD) territory viability significantly predicted ΔEF in patient with severely depressed LVEF, (b=-0.452, p=0.007 and b=7.050, p=0.002), respectively.

CONCLUSION:
Scar burden is an independent factor and is negatively associated with follow-up EF. In patient with IHD and severely reduced EF, a LAD territory viability is a predictor of the change in EF.