

# Quantification of Mitral Regurgitation Using Transthoracic Echocardiography and cardiac Magnetic Resonance Imaging

## Abstract

Both Transthoracic echocardiography (TTE) and cardiac magnetic resonance (CMR) have well-established role in mitral regurgitation (MR) quantification for optimal management strategy. We assessed the correlation between TTE and CMR in the quantification of MR. Participants with isolated MR and echocardiographic mitral regurgitant volume (RVol)  $\geq 30$  mL/beat were included. A consecutive sample of 30 participants (Mean age  $52.7 \pm 19.3$  years, 50% males) was selected and referred for indirect and direct CMR quantification of mitral RVol. There was a statistically significant strong positive correlation between the echocardiographic and indirect CMR quantification of the mitral RVol ( $r = 0.753$ ,  $P < 0.001$ ) and a statistically significant moderate positive correlation between the echocardiographic and direct CMR quantification of the mitral RVol ( $r = 0.530$ ,  $P < 0.003$ ). The inter-observer reliability of the MR grade between TTE and CMR showed a statistically significant moderate agreement ( $\kappa = 0.502$ ,  $P = 0.0001$ ) when the observers used the echocardiographic mitral RVol for grading of MR. On the other hand, the inter-observer reliability of the MR grade between TTE and CMR showed a statistically significant faint agreement ( $\kappa = 0.251$ ,  $P = 0.024$ ) when the observers used the echocardiographic regurgitant fraction (RF) for grading of MR. The positive reciprocal relationship between the CMR and the TTE highlights the potential role of the CMR as a concomitant imaging tool for quantification of the mitral RVol and grading of isolated MR, especially with limited or inconclusive TTE studies. This will enhance the management strategy and improve outcomes.