DIFFERENCES IN LEFT ATRIAL VOLUME INDEX ASSESSMENT ACROSS ECHOCARDIOGRAPHY, CARDIAC MAGNETIC RESONANCE, AND COMPUTED TOMOGRAPHY

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Background

Accurate assessment of left atrial volume index (LAVI) is critical for risk stratification and clinical management in patients with atrial fibrillation. Multiple imaging modalities, including transthoracic echocardiography (TTE), cardiac computed tomography (CCT), and cardiac magnetic resonance imaging (CMR) can assess LAVI but potential variability across modalities remains underexplored.

Methods

This retrospective study included 37 patients who completed TTE, CCT and CMR within 1 year between January 2020 and June 2025. LAVI was measured using standard techniques for each modality and compared across modalities. Each patient's LAVI was further categorized as normal, mildly, moderately, or severely dilated according to guideline-based thresholds. We then compared group assignments between each modality.

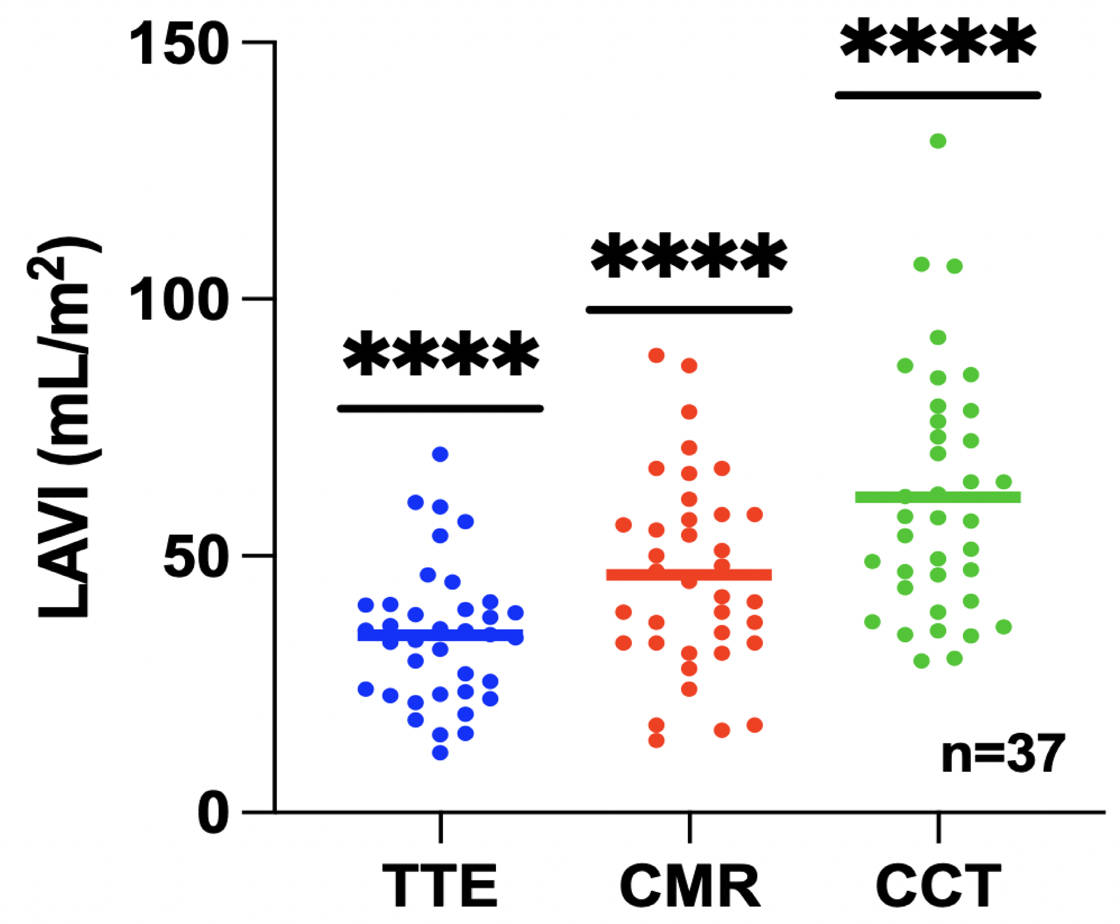

Figure 1A.. Comparison of LAVI Measurements by Modality

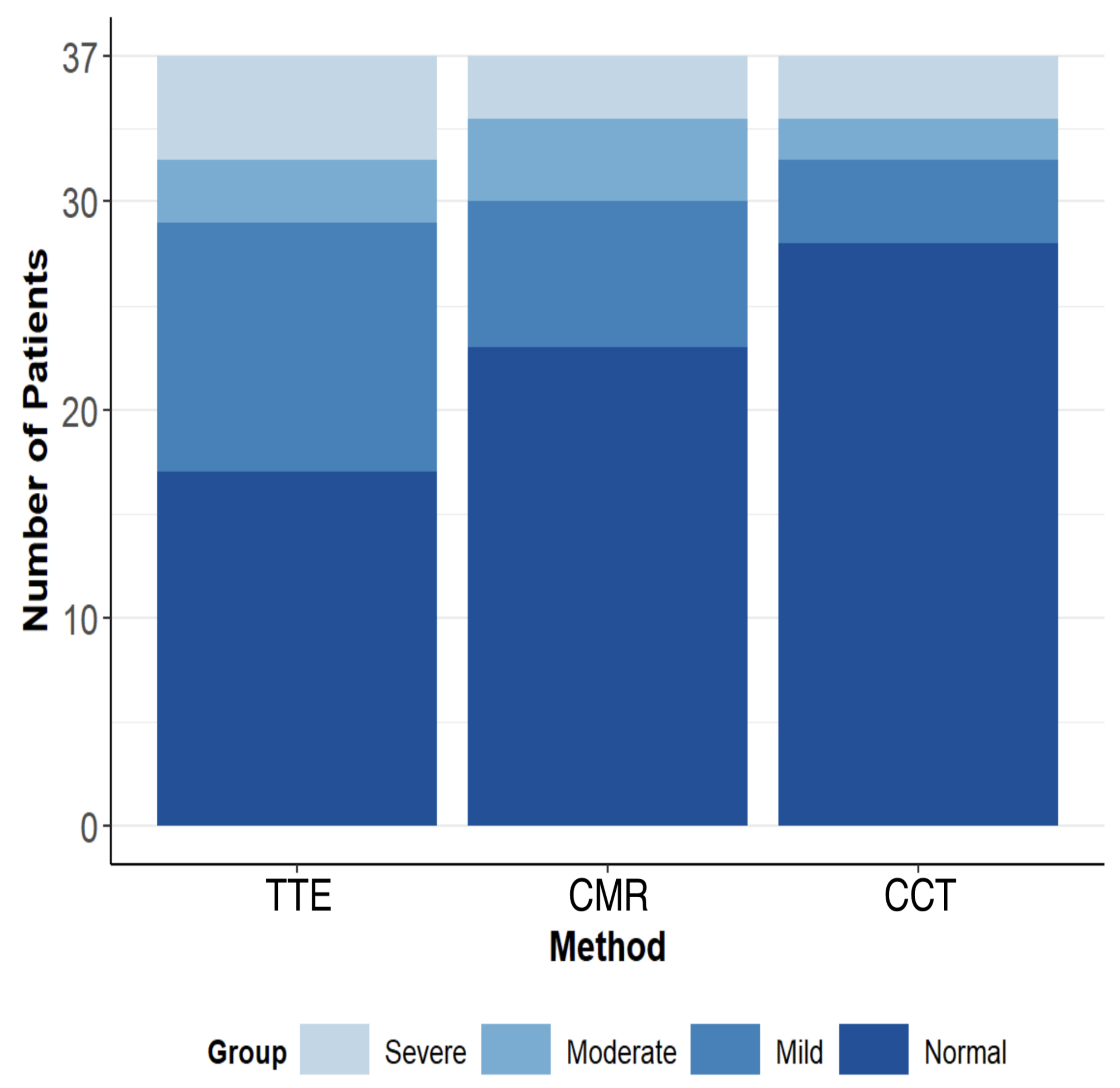

Figure 1B. Severity Classification of LAVI by Imaging Modality

Results

LAVI differed significantly between modalities (Friedman test, $p<0.0001$), with pairwise comparisons showing significantly higher LAVI values respectively on CCT, CMR and TTE (Wilcoxon, $P<0.0001$) (Figure 1A). LAVI group assignment was significantly different between the 3 imaging modalities (Friedman chi2, $P<0.001$) with CT showing lower severity assignment than CMR and TTE (Figure 1B). Pairwise comparison showed significant difference in grouping between TTE and CCT (Wilcoxon, $P<0.01$).

Conclusions

LAVI measurements differ between TTE, CCT, and CMR, with CCT yielding the highest values. This likely reflects differences in volumetric quantification, as CCT directly measures 3D volumes, whereas TTE and CMR rely on 2D-derived estimations. The inconsistency in severity classification highlights potential limitations of TTE for LAVI-based decision-making.

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