

Meeting abstract

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1088 Are there differences in 3D derived ejection fraction between the sexes? A CV MRI study in 2,500 patients

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Introduction

Classically, it has been assumed that the standard mechanical contraction parameter, ejection fraction (EF) is identical across the sexes. Until recently, however, the fidelity and reproducibility of imaging techniques guaranteed virtual superimposition of EF, nullifying any differences were they to be innately present in nature.

Hypothesis

Using high resolution 3D CV MRI, we hypothesized that there would be decreased EF in females as compared to males when examined on a population basis.

Methods

A database composed of consecutive patients who underwent CVMRI scanning (GE, EXCITE HD 1.5 T, Milwaukee, WI) enrolled between Aug 2002 and May 2007 was interrogated to yield all normal patients classified by strict criteria: EF>55%, no valvular disease >1+, no evidence of CAD, HTN, or cardiomyopathy. EF was determined primarily by standard FIESTA 3D methodology or 2D when 3D was not available (<10%). Patients were stratified only by sex and age.

Results

2500 consecutive patients from May 2004 through May 2007 were evaluated, from which 844 were classified as normal, comprising of 403 males and 441 females (mean age 50 ± 9 yrs). All normals passed the Kolmogorov-Smirnov test for Normality. The mean EF for men was 63 ± 5 ;

range: 58.6–68.4%, while for women it was 65 ± 5 ; range: 59.9–69.1%, $p < 0.005$. Under the assumption that EF>55% may not be define all normal thresholding, EF>60 and 65% were also stratified but did not yield significant differences between sexes. Similarly, stratification by decade did not reveal a significant difference. Another separate set of 150 pts with clinical CV disease, representing the entire range of EF (5%–81%), underwent intra and interobserver reproducibility for LVEF and was 0.13 and 0.85%, respectively.

Conclusion

Contrary to conventional doctrine, LV ejection performance (EF) as measured clinically, using highly reproducible and accurate 3D CV MRI, is lower for males than females as determined in the largest CV MRI database (2500 patients) to our knowledge to date examining this subject. Thus, beyond establishing normal ranges for LVEF, these observations have far reaching clinical implications in defining thresholds of normality, as well as belying potential, albeit subtle, intrinsic differences in contractile mechanisms.