

Meeting abstract

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302 Epicardial fat thickness increases with age, body mass index and male sex: the framingham heart study

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Introduction

Epicardial adipose tissue is metabolically active and may serve as both a marker and moderator of cardiovascular risk. Cardiovascular magnetic resonance (CMR) is noninvasive, highly reproducible, and can accurately delineate epicardial fat from myocardium, but few studies have been conducted to determine the relationship between epicardial fat thickness (EFT) and clinical characteristics in a community-living adult population.

Purpose

we sought to characterize EFT and its relationship to sex, age and body mass index (BMI) in a longitudinally-followed cohort known to be free of cardiovascular disease (CVD).

Methods

A total of 1763 adult participants in the Framingham Heart Study (FHS) Offspring cohort, who have been followed by serial examinations since 1974, underwent scanning on a 1.5-T Philips CMR system using an ECG-gated Steady-State Free Precession cine sequence. Of these, data from 1563 (699 men, 864 women) without a history of CVD were analyzed. EFT over the right ventricle at the midlevel was measured from a 4-chamber view by an expert reviewer. Results are summarized as mean \pm SD. Pearson correlation coefficient was used to assess relations between EFT and age and BMI. Sex differences were

assessed using a two-sample T-test and ANCOVA adjusting for age and BMI, with $P < 0.05$ considered significant. An inter-class correlation coefficient (ICC) was used to assess intra- and inter-reader reproducibility with a randomly selected sub-sample of 48 subjects.

Results

Subjects were aged 64 ± 9 years ($p = \text{NS}$, between sexes). EFT (range 0–47 mm) was greater in men (11.1 ± 6.5 mm) than women (8.6 ± 4.9 mm, $P < 0.0001$) even after adjustments for BMI and age. Greater BMI was associated with greater EFT in both men ($r = 0.36$) and women ($r = 0.37$); $P < 0.0001$ for both sexes (Figure 1). EFT weakly correlated with age for both sexes (men: coefficient correlation (r) = 0.12, $P < 0.002$; women: $r = 0.16$, $P < 0.001$). Inter-reader ICC was 0.89 and intra-reader ICC was 0.98 for EFT.

Conclusion

EFT is greater in men than women and is significantly positively correlated with BMI in both sexes. EFT also increases modestly with advancing age. If EFT is shown to be a useful marker of cardiovascular and metabolic risk, our results suggest that "normal" reference values are likely to be gender, and possibly age, specific.

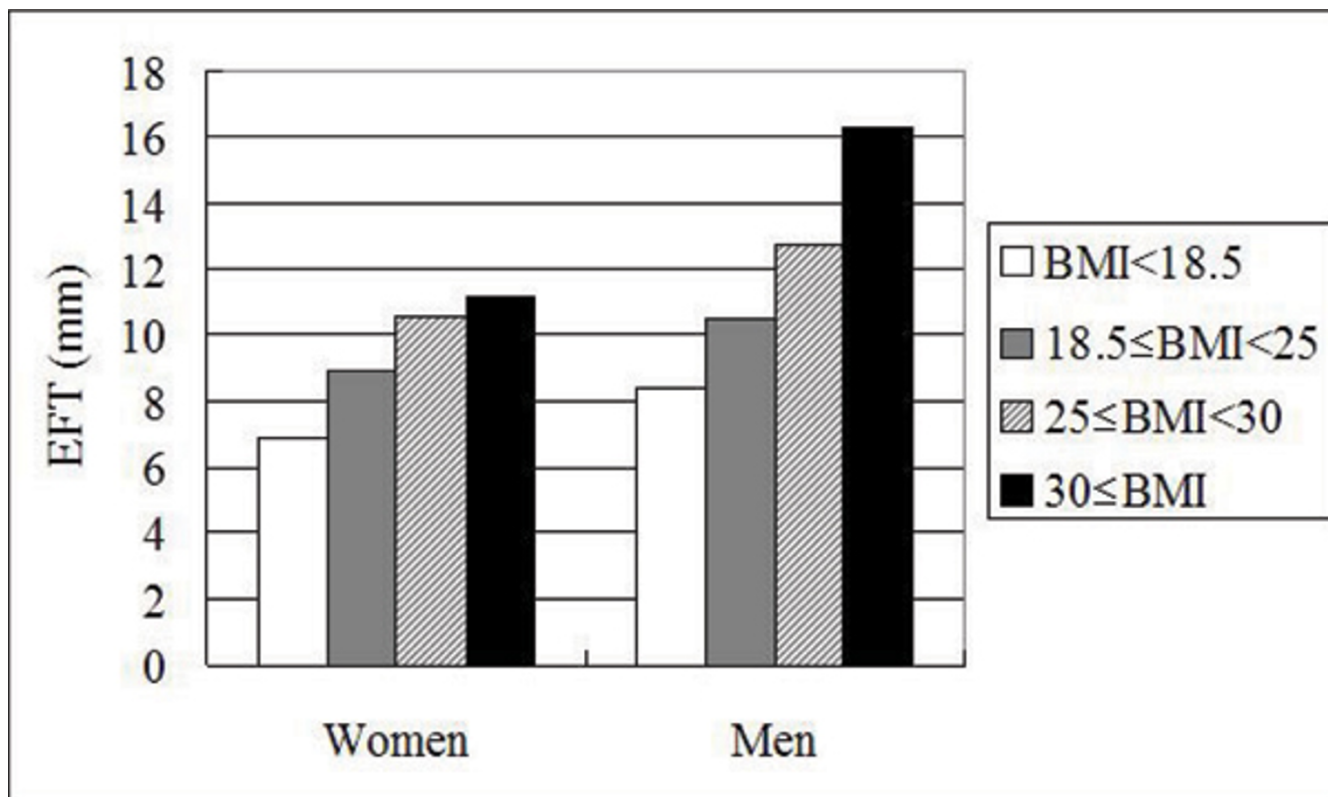


Figure 1
 We sought to characterize epicardial fat thickness (EFT) and its relationship to sex, age and body mass index. EFT measured with CMR is highly reproducible. EFT is greater in men than women and is positively correlated with BMI.

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