

Epicardial Fat Thickness: a Promising Cardiovascular Risk Factor that Requires in-Depth Studies

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Editorial referring to the article: Correlation between epicardial fat thickness and clinical and anthropometric variables in an elderly population

This issue of the International Journal of Cardiovascular Sciences presents a paper by Castanheira et al.¹ that addresses epicardial fat (EF) thickness in an elderly Portuguese population. They describe the mean values of EF thickness and its correlation with anthropometric, echocardiographic, and clinical variables in these individuals.

EF is the visceral adipose tissue located between the myocardium and the visceral pericardium, and commonly found in the atrioventricular and interventricular grooves. EF has several physiological roles, including local effects on the heart, in a paracrine manner.²⁻⁴ EF can be measured non-invasively by echocardiography, and the measurement of EF thickness by 2D echocardiography has been proposed as a surrogate for visceral fat, since it is easier to perform as compared with direct measures such as computed tomography and magnetic resonance imaging (MRI). In addition, a significant correlation between EF and visceral fat measurements by MRI was demonstrated.⁵

Visceral fat accumulation is associated with metabolic syndrome, insulin resistance, impaired glucose tolerance, diabetes mellitus, polycystic ovarian syndrome, and cardiovascular disease.⁶ Moreover, visceral fat is an independent predictor of mortality in males.⁷ Therefore, the non-invasive, cheap and easy assessment of visceral fat, allowed by the EF thickness measurement, is highly interesting. Moreover, increased EF thickness can be directly associated with cardiac disease, such as coronary artery disease (CAD), due to the secretion of proinflammatory adipokines.^{3,8}

Keywords

Pericardium; Adipose Tissue; Portugal/epidemiology; Aged; Anthropometry; Metabolic Syndrome; Echocardiography/methods.

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To test if EF thickness can be a surrogate for visceral fat and consequently, a useful tool for cardiovascular risk stratification, it is important to demonstrate that EF thickness correlates with anthropomorphic measurements, metabolic syndrome, cardiovascular disease and cardiovascular prognosis. EF thickness was described to be greater in patients with metabolic syndrome, independent of sex,^{9,10} to be associated with cardiovascular risk burden,¹¹ CAD,¹²⁻¹⁴ and carotid artery disease.¹⁵ However, EF thickness measurement has limitations, including the fact that it is a linear (instead of volumetric) measure, operator dependency, and poor acoustic window. In addition, issues like the association of EF thickness with diabetes mellitus, dyslipidemia, cardiovascular events, and reference values in the elderly population, remain to be properly addressed.

The study of EF thickness in an elderly population is very important as this population has a higher cardiovascular risk. In the paper by Castanheira et al.,¹ the authors included 34 (25 women, 9 men) very old individuals (mean age 82 ± 8 years) without a previous history of cerebrovascular or cardiac disease. The mean EF thickness was 5.4 ± 1.1 mm, and the authors found a correlation between EF thickness and calf circumference, body weight, body surface area, lean mass, and left ventricular end-diastolic diameter. However, despite the importance of the results, conclusions are limited by the small number of participants, especially men. Potential correlations found by the authors between EF thickness and body mass index ($r=0.3$) and diabetes mellitus ($r=-0.3$) may have reached statistical significance if a larger population had been used. Therefore, the study lacked power to evaluate the proposed correlations between EF and clinical and echocardiographic characteristics in an elderly population.

There are still many issues to be addressed in longitudinal studies with larger samples before the EF thickness can be incorporated into clinical practice as a new cardiovascular risk factor. We need to understand whether the EF thickness is capable of predicting cardiovascular outcomes independent of traditional risk factors, if its changes over time correlate with a worse prognosis, and finally, whether EF accumulation can be reversed with control of risk factors.

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