

Epicardial fat thickness is a marker of preclinical cardiovascular disease in the general population

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INTRODUCTION

Abdominal obesity and hepatic steatosis are ectopic fat depots associated with Metabolic Syndrome (MetS) and their control is associated with reduced cardiovascular mortality. Epicardial Fat Thickness (EFT) is a new discovered marker of ectopic fat, increased with obesity and insulin resistance. Up to now, it is not clear whether different ectopic fat depots, and EFT in particular, are associated with cardiac dysfunction and subclinical atherosclerotic markers in the general population.

MATERIALS AND METHODS

868 subjects from a survey of the general population (the PLIC Study) were included, collecting information about clinical and pharmacological history; biochemical and lipid parameters were available. EFT, aortic calcifications, carotid Intima-Media Thickness (c-IMT) and echocardiographic parameters were determined by ultrasound; advanced vascular disease was defined in presence of atherosclerotic plaques at both carotid and aortic levels. Hepatic steatosis degrees were defined according to a scoring system. Abdominal adiposity was determined using Dual X-rays Absorbimetry (DEXA).

RESULTS

Independently from age, women showed higher EFT versus men (4.5 (0.20-9.00) mm vs 4.00 (0.10-8.00 mm, $p=0.013$); indeed EFT was thicker in post-menopausal versus pre-menopausal women and this difference was not dependent to the use of hormone-replacement therapy. EFT increased with the number of cardio-metabolic determinants ($p=0.007$), as well as ultrasound steatosis degrees and abdominal adiposity (p for trend <0.001 , respectively), and was higher in MetS; this association was more evident in women than in men. Data on the association between different pharmacological treatments and ectopic fat markers depots will be presented. We next evaluated the correlations with markers of cardiovascular disease and EFT was the only ectopic fat marker associated with left ventricular diastolic dysfunction (OR= 1.340 [1.088-1.651] 95% C.I., $p=0.006$). Moreover, hepatic steatosis and EFT were associated with advanced vascular disease (OR= 2.529 [1.328-4.819] 95% C.I., $p<0.001$ and OR= 1.195 [1.008-1.299] 95% C.I., $p=0.042$; respectively), although any associations were observed with c-IMT (marker of subclinical atherosclerosis). Sensitivity analysis showed that, on top of classical cardiovascular risk factors, EFT was the only one to better discriminate both subjects with left ventricular diastolic dysfunction and those with advanced vascular disease, while abdominal adiposity and hepatic steatosis were not. Different correlation grades were observed among the three studied ectopic fat markers, suggesting that they might reflect a more complex spectrum of cardio-metabolic pathways.

CONCLUSIONS

EFT is associated with left ventricular dysfunction and advanced atherosclerotic disease. Our data suggest that, among different ectopic fat depots, EFT may represent an additional tool for the stratification of the cardiovascular risk.