

Correlation of Pericoronary Epicardial Adipose Tissue with Coronary Artery Calcification, and Coronary Atherosclerosis in Egyptian Post-Menopausal Women

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Background and rationale: Previous data demonstrated that regional fat distribution plays an important role in the development of an unfavorable metabolic and cardiovascular risk profile. Epicardial adipose mass reflects intra-abdominal visceral fat, is related to left ventricular mass and other features of the metabolic syndrome, such as concentrations of LDL cholesterol, fasting insulin and adiponectin, and arterial blood pressure.

Aim of the study: To examine the relation of peri-coronary epicardial adipose tissue (EAT) to coronary artery calcification and atherosclerosis in Egyptian post-menopausal women.

Patients and methods: The study enrolled 100 post-menopausal women with suspected coronary artery disease. The amount of EAT surrounding the left main and three main coronary arteries was quantified in axial cuts with the most distinct layer of EAT. The amount of calcium in the coronary arteries was quantified with multidetector-row computed tomography (MDCT) using dedicated software for calcium scoring that is based on the Agatston score. Coronary artery disease severity was assessed in terms of number of vessels affected and severity of coronary stenosis by multiplanner reformation (MPR) technique.

Results: Sixty patients had proven coronary artery disease (CAD) of varying severity (Group I), whereas forty patients showed normal coronaries (Group II). The mean \pm SD (in millimeters) epicardial adipose tissue thickness (EAT) for the entire study cohort in various coronary artery locations were as follows: Left Main (LM-EAT) 12.95 ± 7.86 mm, Left Anterior Descending (LAD-EAT) 8.2 ± 2.3 mm, Left Circumflex (LCX-EAT) 7.4 ± 2 ; and Right Coronary Artery (RCAEAT) 8.5 ± 1.9 . Statistically significant differences were observed between groups I and II with regards to LM-EAT: LAD-EAT; LCXEAT; and RCA-EAT (15.7 ± 8.5 versus 9.11 ± 1.72 , $p=0.006$; 9.1 ± 2 versus 6.88 ± 1.98 , $p=0.001$; 8.27 ± 1.72 versus 6.19 ± 1.79 , $p=0.004$; and 9.23 ± 1.65 versus 7.5 ± 1.9 , $p=0.005$; respectively). Statistically significant differences in LM-EAT: LAD-EAT; LCXEAT; and RCA-EAT values were observed between patients with coronary artery calcium (CAC) scores lower than 400 Hounsfield Units (HU) and those with (CAC) scores equal to or higher than 400 HU (8.99 ± 5.99 versus 13.15 ± 1.94 , $p=0.001$; 8.7 ± 2.1 versus 10.4 ± 2.6 , $p=0.003$, 7.6 ± 1.8 versus 8.9 ± 2.2 , $p=0.005$, and 8.02 ± 1.6 versus 9.48 ± 1.95 , $p=0.008$).

Conclusion: The present study demonstrated a significant correlation between peri-coronary epicardial adipose tissue and coronary artery calcification and atherosclerosis.

Keywords: Artery calcification; Coronary arteries; Calcification; Epicardial adipose tissue