

KORELASI PARAMETER KUANTITATIF *EPICARDIAL ADIPOSE TISSUE* DAN *CORONARY ARTERY CALCIUM SCORE* PADA *CARDIAC CT* DENGAN DERAJAT STENOSIS ARTERI KORONER

Galuh Kartika Dewi¹, Lina Choridah², Hesti Gunarti², Tri Ratnaningsih¹, Yana Supriatna², Bambang Supriyadi², Henry Kusumo H²

¹Program Studi Magister Ilmu Kedokteran Klinis dan ²Departemen Radiologi, FK-KMK, Universitas Gadjah Mada, Daerah Istimewa Yogyakarta-Indonesia

INTISARI

Latar Belakang: *Coronary artery disease* (CAD) merupakan penyebab utama morbiditas dan mortalitas kardiovaskular. Selain faktor risiko klasik, *epicardial adipose tissue* (EAT) berperan dalam proses aterosklerosis melalui mekanisme parakrin dan inflamasi lokal. Parameter EAT serta *coronary artery calcium score* (CACS) dapat diukur secara noninvasif menggunakan *cardiac computed tomography* (CT), namun hubungannya dengan derajat stenosis arteri koroner masih menunjukkan hasil yang bervariasi.

Material dan Metode: Penelitian ini merupakan studi observasional analitik dengan desain *cross-sectional* retrospektif. Subjek adalah pasien dengan kecurigaan CAD yang menjalani *cardiac CT*. Volume dan densitas EAT serta CACS diukur menggunakan perangkat lunak semiautomatis, sedangkan derajat stenosis dinilai berdasarkan klasifikasi CAD-RADS 2.0. Analisis korelasi dilakukan menggunakan uji Spearman.

Hasil: CACS menunjukkan korelasi positif kuat dan bermakna dengan derajat stenosis arteri koroner ($r = 0,734$; $p < 0,001$), dengan mayoritas nilai CACS kategori berat hingga sangat berat ditemukan pada CAD-RADS 4–5. Volume EAT menunjukkan kecenderungan meningkat pada derajat CAD-RADS yang lebih tinggi, namun korelasinya lemah dan tidak signifikan ($r = 0,158$; $p = 0,070$). Densitas EAT tidak menunjukkan korelasi bermakna dengan derajat stenosis ($r = -0,027$; $p = 0,756$). Setelah dilakukan penyesuaian pada analisis multivariat, CACS tetap berhubungan secara independen dan signifikan dengan derajat stenosis arteri koroner ($p < 0,001$), sementara volume dan densitas EAT tidak menunjukkan hubungan independen.

Kesimpulan: CACS merupakan parameter paling kuat dalam memprediksi derajat stenosis arteri koroner. Parameter EAT tidak berhubungan secara independen dengan derajat stenosis setelah dilakukan penyesuaian, yang menunjukkan bahwa EAT lebih mencerminkan aspek biologis dan inflamasi aterosklerosis dibandingkan penyempitan lumen anatomis.

Kata Kunci: *Epicardial adipose tissue*, densitas, volume, stenosis koroner, *coronary artery calcium score*

CORRELATION OF QUANTITATIVE EPICARDIAL ADIPOSE TISSUE PARAMETERS AND CORONARY ARTERY CALCIUM SCORE ON CARDIAC CT WITH THE SEVERITY OF CORONARY ARTERY STENOSIS

Galuh Kartika Dewi¹, Lina Choridah², Hesti Gunarti², Tri Ratnaningsih¹, Yana Supriatna², Bambang Supriyadi², Henry Kusumo H²

¹Master Program in Clinical Medicine and ²Department of Radiology, Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University, Special Region of Yogyakarta, Indonesia

ABSTRACT

Background: Coronary artery disease (CAD) is a leading cause of cardiovascular morbidity and mortality. Beyond traditional risk factors, epicardial adipose tissue (EAT) plays a role in atherosclerosis through local paracrine and inflammatory mechanisms. EAT parameters and coronary artery calcium score (CACS) can be assessed noninvasively using cardiac computed tomography (CT); however, their associations with the severity of coronary artery stenosis remain variable.

Methods: This study was an observational analytic study with a retrospective cross-sectional design. The study population consisted of patients with suspected CAD who underwent cardiac CT. EAT volume, EAT attenuation, and CACS were measured using semi-automated software, while coronary stenosis severity was assessed according to the CAD-RADS 2.0 classification. Correlation analysis was performed using Spearman's test.

Results: CACS showed a strong and significant positive correlation with coronary artery stenosis severity ($r = 0.734$; $p < 0.001$), with the majority of severe to very severe CACS values observed in CAD-RADS 4–5 categories. EAT volume demonstrated an increasing trend with higher CAD-RADS grades; however, the correlation was weak and not statistically significant ($r = 0.158$; $p = 0.070$). EAT attenuation was not significantly correlated with stenosis severity ($r = -0.027$; $p = 0.756$). After adjustment in multivariate analysis, CACS remained independently and significantly associated with coronary artery stenosis severity ($p < 0.001$), whereas EAT volume and attenuation were not independently associated.

Conclusion: CACS is the strongest parameter for predicting the severity of coronary artery stenosis. EAT parameters were not independently associated with stenosis severity after adjustment, suggesting that EAT more accurately reflects the biological and inflammatory aspects of atherosclerosis rather than anatomical luminal narrowing.

Keywords: Epicardial adipose tissue, attenuation, volume, coronary stenosis, coronary artery calcium score