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Determinants of Coronary Artery Calcium Score in Patients Undergoing Cardiac Computed Tomography at a Private Hospital in Tirana, Albania: A Cross-Sectional Study

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Abstract

Background: Coronary artery calcium (CAC) scoring by computed tomography (CT) is a validated marker of subclinical coronary atherosclerosis, but its correlates have not been described in Southeast European clinical populations.

Aims: To describe the distribution of the coronary artery calcium score (CACS) and to identify the demographic, anthropometric, clinical, and coronary-anatomical factors independently associated with it in patients undergoing cardiac CT at a private hospital in Tirana, Albania.

Study design: Retrospective, single-center, cross-sectional study.

Methods: We analyzed 111 consecutive patients who underwent cardiac CT with calcium scoring over a three-month period, referred for a routine cardiovascular check-up or for signs and symptoms suggestive of coronary disease. Demographic, anthropometric, risk-factor, and CT-derived variables (CACS, percentage arterial stenosis, coronary dominance, myocardial bridging, aortic root diameter) were compared between patients with detectable (CACS>0) and undetectable (CACS=0) calcium, and multivariable linear regression on log-transformed CACS was performed.

Results: Mean age was 57.3±11.0 years (55.0% men); 53.2% had a CACS of 0. Patients with detectable calcium were older (60.6 vs 54.3 years, p=0.002) and more often diabetic (44.2% vs 6.8%, p<0.001). CACS correlated strongly with percentage stenosis of the left anterior descending

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(rho=0.833), right coronary (rho=0.744), and circumflex (rho=0.727) arteries (all p<0.001), and moderately with age (rho=0.350, p<0.001), but not with body mass index or aortic diameter. On multivariable analysis, age (p=0.002), male sex (p=0.002), and diabetes (p<0.001) were independent predictors of a higher calcium burden, whereas hypertension, hypercholesterolemia, smoking, and body mass index were not. Calcium burden was highest among patients referred for suspected acute coronary syndrome or chest pain and lowest among those undergoing a routine check-up (p=0.001).

Conclusion: Age, male sex, and diabetes mellitus were the main independent determinants of coronary artery calcium burden in this clinical population, supporting the use of calcium scoring for cardiovascular risk stratification in this setting.

Keywords: Albania, coronary artery disease, coronary vessels, risk factors, tomography x-ray computed, vascular calcification