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Extended abstract

Comparison of Agatston CT coronary artery calcium score, Framingham score and blood biomarkers as predictors of coronary artery stenosis

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Purpose: Coronary CT angiography (CCTA) with calcium scoring measured with Agatston score index provides a diagnosis of coronary atherosclerosis in patients with subclinical coronary plaque. We compared diagnostic accuracy of Agatston score, Framingham Risk score and multiple blood biomarkers in predicting coronary artery disease (CAD) that caused stenosis >50%.

Methods: This retrospective single-center study is evaluating the role of Agatstone score in prognostication of coronary artery stenosis in patients who presented with atypical chest pain and non conclusive stress test result. The study included 368 patients with unknown coronary heart disease (mean age 62.2±7.7; 62% of females) who underwent CCTA and obtained Agatston score, in our Center from June 2012 till June 2013. Scanning was done with dual-source MDCT (Somatom Definition FLASH; Siemens Medical Solution, Munich, Germany) equipped with two 128-detector row units using the prospective or retrospective ECG-gating protocol and the mean received amount radiation was 6.85±9.74mSv. Exclusion criteria included pre-existing kidney failure (eGFR <60 mol/min/1.73m^2), atrial fibrillation, as well as incomplete data, Agatston score above 800. All patients with heart rate higher than 80/min received beta blocker. The mean heart rate during scanning was 60±9.3/min, and patients body mass index (BMI) 28±3.9. Patients with known cardiovascular risk factors, including hypertension (80%), diabetes mellitus (29%), dyslipidemia (71%) or smoking (25%), and Framingham risk score values (mean 20±11.9) were considered. Blood biomarkers included glucose, C-reactive protein (CRP), total cholesterol, LDL-cholesterol, HDL-cholesterol, triglycerides and uric acid. Participants were divided in two groups, based on coronary artery stenosis greater than 50% (83; 23% of participants), and the other with stenosis smaller than 50% (285; 77% of participants). Frequency of demographic and clinical charasterics, blood biomarkers and risk factors were tested between the groups by using Chi square test and Student T test as appropriate. Relative Risk was calculated in context of developing coronary artery stenosis greater than 50% in participants with Agatston score above 100.

Results: The most acccurate predictor of coronary artery stenosis greater then 50% was Agatstone Score (AUC 0.89, p<0.0001). Agatstone Score higher than 100, had relative risk for developing of coronary stenosis over 50% 15 times higher than values under 100. CRP (AUC 0.76), glucose (AUC

0.59), uric acid (AUC 0.61) and Framingham Risk Score (AUC 0.57) had high sensitivity but low specificity for coronary artery stenosis.

Conclusion: Among all considered demographic and clinical characteristics, blood biomarkers and risk factors, Agatstone score was the most accurate predictor for developing of coronary artery stenosis.

Literature

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