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CORONARY CT ANGIOGRAPHY VALIDATES CORONARY RISK FACTORS

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Objectives The Framingham study was the ‘pioneer study’ of coronary risk factors by long-term follow-up of relatively normal populations for major adverse cardiac events (MACE). The accuracy of the prediction has been validated by coronary angiography (CAG). However, CAG shows the arterial lumen while the main pathology is on the arterial wall. The coronary CT angiography (CCTA) provides information on both the arterial lumen and plaque characteristics. Therefore it is better technique to study the coronary risk factors.

Methods CCTA was done consecutively in 706 patients from June 2008 to April 2011 in the department of cardiology. The severity of coronary artery disease (CAD) was graded to ‘normal’, ‘mild’, ‘moderate’, ‘severe’, and ‘revascularisation’. Risk factors were correlated with coronary plaques. Pearson correlation and ANOVA were used to evaluate the relationship between risk factors and coronary plaque. The predictive accuracy was determined by receiver operating characteristic (ROC).

Results A total of 40.37% of patients had normal CCTA whereas 58.63% of patients had abnormal CCTA. There were four main findings. First, the risk factors of age, sex, hypertension, hyperlipidaemia, diabetes mellitus, cerebral infarction, coronary heart disease and myocardial infarction were moderately correlated with coronary-plaque formation of which a clinical diagnosis of CAD was the most accurate predictor, $p < 0.01$. Second, the biochemical parameters of total cholesterol (TC), low-density lipoprotein, high-density lipoprotein, creatinine and homocysteine were moderately correlated with coronary plaque ($p < 0.01$). Third, plaque was correlated with carotid intima-media thickness and Framingham risk score ($p < 0.01$). ROC areas were 0.845 for Framingham risk score, 0.766 for creatinine, 0.697 for homocysteine, 0.693 for IMT and 0.316 for HDL, $p < 0.001$.

Conclusions CCTA has validated the Framingham risk score, creatinine, homocysteine, carotid intima-media thickness and high-density lipoprotein as the major coronary risk factors.