Research Article

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CORONARY ARTERY EVALUATION BY APPLICATION OF CARDIAC CT

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INTRODUCTION

Coronary artery disease
Cardiovascular disease is the leading cause of death worldwide,[1] Several factors responsible for the increasing percentage of cardiovascular diseases, including a tobacco use, longer average life span, decreased physical activity, and consumption of unhealthful foods.[2]

Coronary artery disease (CAD), is caused by the build- up of plaque in the arteries that supply blood to the heart which is rich in oxygen. Plaque is a mixture of fat, cholesterol, and calcium deposits, can build up in the arteries over long period.[3]

This plaque can cause the narrowing and hardening of the coronary arteries.

Coronary heart disease can often be symptom-free but people with CHD have an increased risk of angina, heart attack, heart failure, and arrhythmias.[4]

Coronary artery disease involves the formation of pathological changes in the wall of one of more of the coronary arteries, so-called hardening of the arteries or arteriosclerosis, and is the most common cause of acute coronary events, that is, acute myocardial infarction or unstable angina pectoris.[5]

Coronary calcification
The presence of coronary calcifications in the intima of the coronary wall is invariably associated with atherosclerotic plaque.[6]

Quantification of the total amount of coronary calcification by electron beam computed tomography (EBCT),[7] which is more sensitive than previous methods.

It is very useful for predicting clinically significant coronary artery disease in addition to future cardiovascular events.[8]

Coronary artery calcification (CAC) results in reduced vascular compliance, abnormal vasomotor responses, and impaired myocardial perfusion.[9]

The presence of CAC is associated with worse outcomes in the general population and in patients undergoing revascularization.[10]

Electron-beam computed tomography (EBCT) can noninvasively and accurately detect coronary calcification, which is a predictor of ischemic heart disease. Plaque calcifications usually precede luminal narrowing and the onset of angina symptoms. The sensitivity and specificity of EBCT for the detection of stenosis have been reported to be >90 and >50%, respectively.[11,12]

PATIENT METHODS

This cross sectional study include 100 patients who were referred for the assessment of suspected coronary artery disease with CCTA on ≥64-slice CT scanners, (male 52 and female 48) and mean age 56 ± 14 years.

Who underwent elective EBCT and CT angio of coronary arteries between January and July 2017 at cardiology clinic at Baquba Teaching Hospital.

Coronary calcium score was measure using Agatston's method and coronary lesion determined by CT angio and stenosis of equal or more than 50% of LMS or equal, stenosis of 70% or more of other coronary arteries consider as obstructive lesion, while lesion of less than 50% of LMS or less than 70% of other coronary consider as no obstructive lesion.

The images was evaluated by three expert observer who had no knowledge of clinical data.

Quantitative stenosis estimated by measurement of lumen diameter manually and also guided by visual assessment.

Calculation of data was done using SPSS 16 and correlation was done to evaluate if there is any relation between coronary artery calcification by calcium score and coronary artery stenosis by CT angio.

RESULT

CT angio identify 39 cases were obstructive lesion, 17 were non-obstructive lesion and 44 were normal CT angio of coronary artery.

In our study we found that coronary calcification is llppppppppcorrelated with coronary artery stenosis (highly significant correlation P value =0.0001) as shown in figure (1) below.
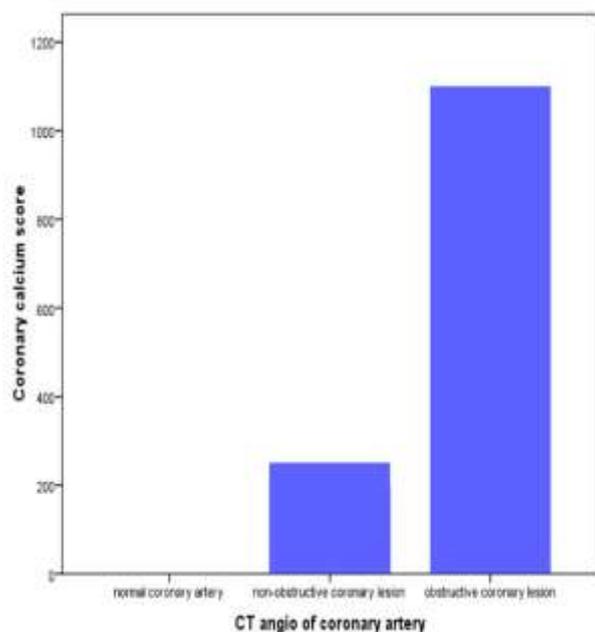
Figure 1: Show correlation between calcium score and stenosis of coronary artery. And that shows the more coronary stenosis percentage the more score of calcium as showed in figure 1.

DISCUSSION

EBCT used for detection of coronary calcification is very useful For prediction of coronary artery stenosis.

Detection of coronary calcification is very useful for evaluation of patient with suspicion of coronary artery stenosis.

There is supporting evidence that calcium formation is associated with coronary artery disease.[13]

In our study there was very significant correlation between coronary calcification and coronary artery stenosis by CTA, and this agree with the study of Kajinami et al,.[14]

The CT angio is also usefull in assesing number of coronary artery involved and degree of stenosis, in our study there were about 44% of cases with normal coronary artery, 39% show obstructive coronary lesion and 17% show non obstructive coronary artery lesion, and this also agree with study of Niazi et al, that stated about rule of CTA in estimating number and degree of stenosis.[15]

CONCLUSION

Coronary calcium score is recommended in cases of low probablity coronary artery disease, and CTA also recommended for cases with contraindication of cardiac stress test and suspecion of coronary artery disease, and more indications.

In our research there was significat correlation between coronary califications and stenosis, but we should not forget there is possibilty of cases with zero calcium score but associated with coronary artery stenosis.

Our recommendation is to do research with more cases to focus the light on such important evaluation.

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