Evaluation Sensitivity and Specificity of CT Angiography for Diagnostic LAD and LCX Lesions

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ABSTRACT

Introduction: Left Main Coronary Artry Disease (LMCA) is a major risk factor for mortality and morbidity. Ct Angiography is a non-invasive screening method for detecting these lesions. The aim of this study was to compare the results of CT Angiography with Conventional Angiography in detecting Left Main, LAD, and LCX lesions, and also the relationship between background variables and diagnostic testing.
Materials and Methods: This retrospective study was conducted in 2018 at Tabriz University of Medical Sciences. Information was collected from patients undergoing CT Angiography and Conventional Angiography. Data were analyzed using SPSS software in order to determine the relation.
Results: None of the variables in the study had a significant relationship with the results of diagnostic tests. The sensitivity and specificity for LAD was 0.40 and 0.23, and 0.53 and 0.21 for LCX, respectively.
Conclusion: The results of this study indicate that there is no relationship between the background variables and the results of diagnostic tests.

Key words: Left main, CT angiography, Conventional angiography

INTRODUCTION

Left Main Coronary Artery Disease (LMCA) remains an important risk factor for mortality and morbidity. The most common etiologic factor of LMCA is atherosclerosis [1]. Computed tomographic (CT) angiography is used as a non-invasive method for the detection of obstructive coronary artery lesions [2,3]. Nevertheless, this method has disadvantages and limitations in the field of diagnosis [4,5].

Due to limitations in CT angiography, Conventional Coronary Angiography is known as the Gold Standard diagnostic tool for LMCA lesions [6]. Conventional Coronary Angiography has the ability to determine the extent, location, and severity of lesions [7,8].

According to literature, CT angiography is used as a non-invasive method for screening coronary artery disease, including the Left Main. Considering the limitations of this method and the common use of Conventional angiography as the Gold standard, the present study was designed to investigate the relationship between the results of Conventional angiography in patients with Left Main lesions reported their CT angiography in Tabriz University of Medical Sciences.

MATERIALS AND METHOD

The present study was conducted retrospectively in summer 2018 at Tabriz University of Medical Sciences. Information was extracted from the records of patients visiting Health centers of Tabriz University of Medical Sciences, which underwent CT angiography due to unstable or stable angina and then underwent conventional angiography due to indications.

Patient selection criteria include:

1. Undergoing CT angiography at Tabriz University of Medical Sciences

2. Undergoing conventional angiography at Tabriz University of Medical Sciences

3. No history of coronary artery bypass surgery

4. No history of coronary artery angiography

5. Full report of diagnostic procedures

6. Left main lesion report in CT angiography

Information including age, sex, smoking status, diabetes, blood pressure, calcification, hyperlipidemia, familial history, existence of LAD, LCX, and Left Main lesions in CT angiography and LAD, LCX and Left Main lesions in Conventional Angiography were extracted based on existing reports.

RESULTS

Among the records, 49 records were selected according to the inclusion criteria. Twelve were female and 37 were male patients. The mean age was ± 9.98. Information extracted from the records is described in Table 1.

Table 1: Inclusion

	Smoking	Diabetes	Blood Pressure	Hyperlipidemia	Familial History
Positive	10	15	24	12	1
Negative	39	34	25	37	48

Based on Chi-Square test results, none of the variables listed in Table 1 had a significant relationship with the LAD, LCX, and Left Main lesions observed in angiography or CT Angiography (P-value>0.05). Regression analysis to predict the probability of LAD, LCX, and Left Main situations in Conventional Angiography and CT Angiography show that none of the independent variables has predictive value.

Based on the information, Positive Predictive Value, Negative Predictive Value, Sensitivity and specificity for CT Angiography of LAD, LCX is in accordance with Table 2. According to the patient selection method for Left Main, only Positive Predictive Value and Sensitivity could be calculated.

Table 2: Positive predictive value, negative predictive value, sensitivity and specificity for CT angiography of LAD, LCX and left main

	LAD	LCX	Left Main
Positive predictive Value	0.66	0.63	0.24
Negative Predictive Value	0.09	0.14	
Sensitivity	0.4	0.53	0.24
Specificity	0.23	0.21	
Accuracy	0.79	0.72	

DISCUSSION

Based on the results of this study, Positive predictive value and negative predictive value of CT angiography for diagnosis of LAD lesions were 0.66 and 0.09, respectively. Based on the results of this study, Positive predictive value and negative predictive value of CT angiography for diagnosis of LCX lesions were 0.63 and 0.14, respectively. These values are different in studies for different lesions. According to the Miller et al. Study on coronary artery, using 64 Row CT, Positive Predictive Value and Negative

Predictive Value were 0.91 and 0.83, respectively [9]. According to Fine et al., Positive Predictive Value and Negative Predictive Value for the 64-Slice device were 97% and 92%, respectively [10].

According to a study by Hamon et al., there are differences in the results of various studies by Conventional Angiography and CT Angiography [4]. One of the reasons for this difference may be the type of device used in CT angiography. The 16-slice device is lacking in accuracy and sufficient diagnostic capability, while the 64-slice device has decent functionality in many conditions [11]. Other factors leading to differences in the results of various studies include resolution, slice thickness reduction and shorter acquisition time [12-14].

CONCLUSION

The results of this study indicate that there is no relationship between the background variables and the results of diagnostic tests.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest.

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