Significant LAD Involvement in Coronary Artery Angiography with Ischemia in Blood-Supplied Regions

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ABSTRACT

Objective: Angiography is recognized as the golden standard for studying coronary artery diseases and its use is increasing widely. However, the most common method for screening patients suspected of coronary heart disease prior to invasive interventions is using the angiography test. The aim of this study was to determine the incidence of significant LAD involvement in angiography of the coronary arteries in patients with ischemia in blood supplied regions. Methods: During this cross-sectional study, patients referred to the emergency unit of Imam Ali and Imam Reza hospitals in Kermanshah, as well as Farshchian hospital in Hamadan were studied. After obtaining the history and initial examination, noninvasive angiography was conducted on patients. Eventually, the results of angiography were analyzed. Data were analyzed using SPSS software. Results: 87 (64.4%) out of 135 patients, were males, and 48 (35.6%) were females. The age of the patients was recorded to be between 47-77 years with a mean and standard deviation of 61.65 ± 8.66 years. Angiographic results showed that, 75% of the patients had LAD involvement, which means that 34 patients were involved with LAD. Conclusion: According to the results of this study, using coronary artery angiography is beneficial in patients with cardiac pain and can evaluate the cardiac pain with a high sensitivity, specificity and accuracy.

Key Words: Angiography, Cardiac Pain, LAD Involvement.

INTRODUCTION

Coronary artery disease (CAD) is responsible for more fatality and disabilities in the developed world than any other disease, not to mention the economic costs. Coronary artery disease is the most common chronic life-threatening disease in the United States which has involved more than 12 million people in the country. More than 6 million suffer from angina pectoris and more than 7 million come with a history of myocardial infarction. High-fat and high-energy diet, smoking, and sedentary lifestyle are the main factors involved in increasing the incidence of CAD. With the rise of urban lifestyle in the developing world, the prevalence of CAD risk factors is increasing very fast in these regions.

It is assumed that the CAD will be the most common cause of death around the globe in 2020 [1].

According to the World Health Organization, chronic diseases are responsible for 70% of deaths in Iran, of which 42% are cardiovascular diseases. In addition, according to WHO, CAD is ranked first in the list of 10 main causes of deaths in Iran, claiming 21% of the patients' lives [2, 3]. In Iran, 38% of death toll are associated with cardiovascular diseases [4]. 6.9% of men and 6% of women suffer from coronary artery diseases [5].

The pathogenesis of coronary artery disease includes involving of the coronary vessels are in various multiple forms. In a number of patients, the involvement is limited to the terminal part of a vessel, while in others multiple involvements of the vessel including the proximal part may occur. Based on the observations, it appears that there is a relationship between the severity of coronary artery disease and a number of cardiovascular risk factors i.e. diabetes [6, 7].

The risk factors for coronary artery disease can be categorized into three groups of biological, psychosocial, and social. Cardiologists recognize some physical factors to be associated with cardio vascular diseases. High blood pressure, high levels of harmful cholesterol, diabetes, obesity, inherited disease, blood fat, and smoking are among risk factors which are manageable [8, 9].

Coronary arteries are the main vessels feeding the heart. They originate from the aorta, immediately above the cusps of aortic valves and are responsible for the blood supply to the cardiac muscle. The blood is supplied by the two right and the left coronary arteries [10].

Timely diagnosis and treatment of coronary artery diseases can reduce the mortality and complications associated with these diseases in patients [11]. Among the diagnostic methods, angiography is recognized as the main method and golden standard for diagnosis, determination of coronary arteries obstruction and treatment interventions [12] which is being used widely today [13].

Studies show that there is a difference between the rate of obstruction in coronary arteries among studies. Azimzadeh et al. (2003) studied patients in Kerman city and concluded that most of the patients had non-pathologic obstruction. However, many other studies report much less of normal and non-pathological obstructions [14-17].

Masoumi and Asadi reported that pathologic involvement of a vessel was the highest rate of involvement [14, 18]. In contrast, Taqavi et al. (2010) stated that comorbid involvement of 3 vessels was the most involvement observed.

Vascular diseases are responsible for most fatality rate among women and men. Up to now, a number of factors including age, family history, fat disorder, high blood pressure, diabetes and smoking are recognized as risk factors in this disease [4]. In addition to causing coronary artery disease, these risk factors are also responsible for severity and extent of vascular occlusion [5].

According to angiography studies, it can be assumed that a relationship is present between risk factors for coronary disease and ischemia [6]. On the other hand, a number of studies do not confirm this relationship [7].

Masoumi et al. reported that the there is a statically significant difference between prevalence of involvement in three vessels, two vessels and one vessel in the group of males and females [8]. Hing Heygoy et al. reported that there is a significant difference between patients suffering from diabetes and coronary artery disease with patients who only had coronary artery disease [9]. Melidonis et al. stated that the prevalence of three vessels involvement in diabetic patients was higher compared to non-diabetic patients [10].

Using interventional and diagnostic cardiology is increasing every day. Angiography is the gold standard in examining coronary artery diseases and its use is widely spreading. However, the most common method for screening patients suspected of coronary heart disease prior to invasive interventions is angiography. Therefore, we evaluated the prevalence of significant LAD involvement in coronary artery angiography of patients with evidence of ischemia in blood supplied regions.

METHOD

The statistical population of this cross-sectional descriptive-analytic study included all patients with complaint of thoracic pain referred to the heart clinic of Imam Ali and Imam Reza Hospital in Kermanshah University of Medical Sciences and Farshchian Hospital of Hamadan. Samples were selected using availability method and according to the confidence level of 95%, 135 patients were selected as sample.

In this study, the history of the patients with chest pain was obtained initially by a physician and based on the type, nature, and location of the pain, full thoracic echocardiography was performed on patients under the supervision of the physician. All echocardiography images were taken two-dimensionally by a M-MODE.2D Doppler in four paracentral views (longitudinal and transverse axis) and apical (4 & 2 chambers) in the basic position, as well as left lateral position while leaning. All images were recorded digitally.

CAD was defined as obstruction of at least one of the major epicardial coronary arteries (obstruction of at least 50% of the artery diameter). Demographic characteristics and the frequency of risk factors for coronary artery diseases including gender, age, BMI, diabetes (fasting blood glucose higher than 126 mg / dL and randomized blood glucose higher than 200 mg / dL), Hypertension (blood

pressure higher than 140.41 mmHg, and increased blood pressure during treatment) in all patients.

Exclusion criteria included volunteer angiography. Based on the type of test result, angiography was requested for the patients, and eventually, the results from both tests were recorded in a data sheet. The data were analyzed by SPSS software version 22.

RESULTS

The results of the study indicate that the range of patients' age was between 47-77 years, with a mean and standard deviation of 61.65 ± 8.66 years. 87 (64.4%) patients were males and 48 (35.6%) were females. 71 (52.6%) patients had a history of diabetes and 64 (47.4%) had no history of diabetes. 70 patients had a history of high blood pressure and 65 had no history of high blood pressure. 71 patients had a history of smoking, and 64 had no history of smoking.

Based on angiography, 34 patients had LAD involvement

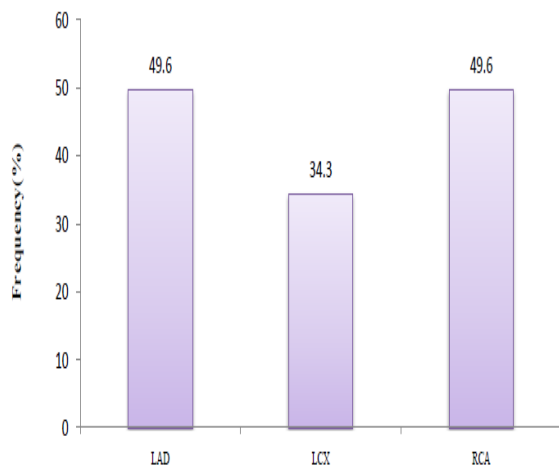**Diagram 1: Angiography distribution chart**

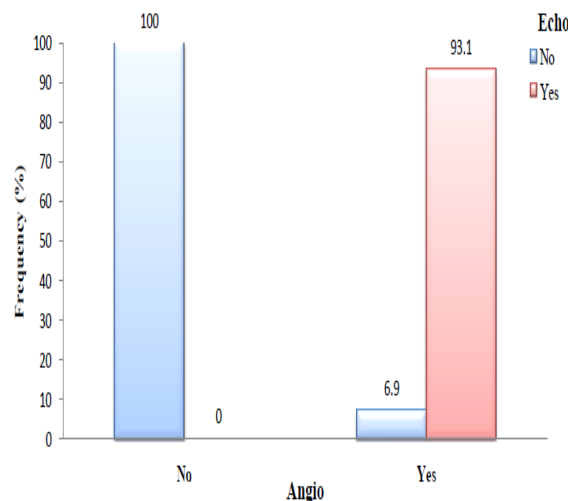**Diagram 2: Cumulative distribution of angiography outcomes**

Diagram 3: Distribution of frequency for the results of LAD involvement according to the results of angiography in cardiac patients

DISCUSSION AND CONCLUSION

Evaluating the effects of different factors on emergence of coronary artery diseases and factors affecting mortality due to surgery still need further investigation. Therefore, we can manage to prevent the disease and complications related to it.

Based on the results of this study 70% of patients had LAD involvement. In addition age of patients was in range of 47-77 years, with a mean and standard deviation of 61.65 ± 8.66 years. 87 (64.4%) patients were males and 48 (35.6%) were females. 71 (52.6%) patients had a history of diabetes and 64 (47.4%) had no history of diabetes. 70 patients had a history of high blood pressure and 65 had no history of high blood pressure. 71 patients had a history of smoking, and 64 had no history of smoking.

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