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Original Article

Frequency and Extent of Multivessel Coronary Artery Disease in Patients with Non St-Segment Elevation Myocardial Infarction (Nstemi)With Raised Cardiac Troponin -T (CTNT)

Muhammad Salman[1], Muhammad Abbas Khan[1*], Muhammad Yousaf[2], Inam-U-Ilah[3], Mumtaz Hussain[4], Adeel Sarfraz[4]

[1]Department of Interventional Cardiology, Medical Teaching Institution Hayatabad Medical Complex Peshawar, Pakistan
[2]Department of Biochemistry, Bahauddin Zakariya University, Multan, Pakistan
[3]Department of Food Sciences, The University of Haripur, KPK, Pakistan
[4]Department of Anatomy & Histology, Faculty of Veterinary and Animal Sciences, The Islamia University of Bahawalpur, Pakistan

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***Corresponding Author:**
Muhammad Abbas Khan
Department of Interventional Cardiology, Medical Teaching Institution Hayatabad Medical Complex Peshawar, Pakistan
drabbas.cardio@gamil.com

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ABSTRACT

Myocardial infarction is among the related events in acute coronary syndrome, which also comprise unstable angina pectoris, ST-segment elevation myocardial infarction, and non-ST-segment elevation myocardial infarction**. Objective:** To determine the prevalence of multi-vessel coronary artery disease in non-ST-segment elevation myocardial infarction with observably increased troponin T concentrations. **Methods:** There were 284 patients participated in this research. Patients with cardiac troponin T concentrations above 500 ng/l (the recommended limit is 14 ng/l) who had previously had heart problems, tiredness, or other angina-related indications, regardless of gender, between the ages of 30 and 60, were also included in the research. **Results:** The study group consisted of 95 (33.46%) non-smokers and 189 (66.54%) smokers. Electrocardiogram alterations were detected in 179 (63.02%) participants, whereas no changes were detected in 105 (36.97%) individuals. Additionally, 113 individuals (39.78%) had multi-vessel coronary artery disease, compared to 171 (60.22%) who did not. **Conclusion:** We come to the conclusion that almost any person with elevated troponin T levels, despite the apparent absence of ST-segment elevation, may undergo cardiac catheterization to ascertain the diagnosis of multi-vessel coronary artery disease.

INTRODUCTION

Myocardial infarction (MI) is among the related events in acute coronary syndrome, which also comprise unstable angina pectoris, ST-segment elevation myocardial infarction (STEMI), and non-ST-segment elevation myocardial infarction (NSTEMI) [1, 2]. Coronary artery disease (CAD) is the largest cause of death globally, resulting in the deaths of more over five million individuals annually. NSTEMI has traditionally been much more prevalent than STEMI. Internationally, healthcare fatality rates range from 2 to 5%, with certain countries having rates was high as 72 per 1,000 hospitalized patients annually [3-5]. Despite the fact that STEMI seems to be more deadly since it signifies a breach in the entire myocardial wall, there is compelling evidence that several NSTEMI individuals are actually suffering from a more serious condition [6]. According to new findings by the American College of Cardiology and the National Cardiovascular Data Registry, 41percent of the total of patients with NSTEMI had multi-vessel coronary artery disease (MVD), which required additional hospital

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treatment. A diagnosis of MVD is made when two epicardial coronary arteries have stenosis of at minimum 49% [7, 8]. Compared to patients with single-vessel disease, individuals with MVD performed fine and experienced a decreased death rate. Blood circulation might well be redirected across blocked arteries using both angioplasty and bypass surgery. Additionally, thrombolysis may lessen the risk of thrombi developing in the left ventricle [9-11]. Despite conflicting evidence, troponin T (TropT) is frequently employed as a sign of myocardial wall destruction. It can detect underlying MVD in the overall population [12]. While some studies have linked high TropT concentrations to non-STEMI, other research demonstrates that patients with comparable symptoms are more likely to develop MVD [13, 14]. The purpose of the current research was to assess the prevalence of MVD in NSTEMI having noticeably elevated TropT concentrations. This would make it easier to recognize people who need to be classified as significant risk and sent for coronary revascularization as soon as possible in order to enhance their treatment outcomes.

METHODS

This cross-sectional research was conducted at Hayatabad Medical Complex, Peshawar from March 2022 to September 2022. There were 284 patients participated in this research. Patients with cardiac Troponin T (CTNT) concentrations above 500 ng/l (the recommended limit is 14 ng/l) who had previously had heart problems, tiredness, or other angina-related indications, regardless of gender, between the ages of 30 and 60, were also included in the research. Patients on hemodialysis or having a blood creatinine concentration exceeding 1.4 mg/dl were eliminated. Abnormalities in the ECG, such as left bundle branch block and Q waves, could lead to STEMI. A physician examined the patient, and while doing so, also reviewed their medical history. Eight and 48 hours after the patient's admission to the hospital, CTNT concentrations in their blood were assessed. The COBAS ELECTROSYS 2010 ROCHE analyzer was used to measure the TropT concentrations in the tissues. TropT concentrations greater than 500 ng/l were considered clinically significant. In the first three days of the same hospital stay, the coronary angiography was completed. Before assessing the lesion in line with predefined norms, a senior cardiologist with at least five years of experience above the fellowship concentration assessed coronary angiographic pictures. Variable data on CDMV outcomes were produced using a standard formula. We used SPSS 20.0, a statistical application specifically designed for use by social scientists, to examine the data. For statistical information, mean and standard deviation were calculated; for qualitative data, frequencies and percentages were calculated. Based on the findings of a qualitative test, individuals with multivessel severe CAD were divided into several groups using chi-square analysis. Results that had a p-value below 0.05 were considered important.

RESULTS

Out of the 284 patients, 209 (73.59%) were men and 75 (26.41%) were women (figure 1).

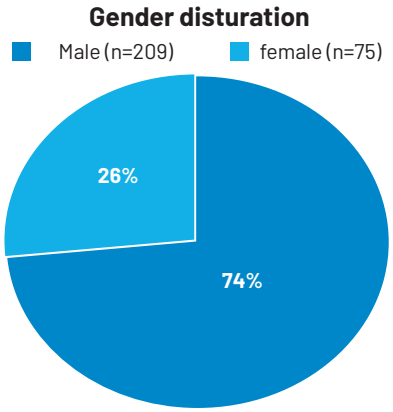

Figure 1: Gender Distribution of Patients

Participants' ages ranged (30 to 60 years), with a 48.54 ± 6.53 average age. Greater parts of the individuals (146, 51.42%) were among age range (51- 60 years) (figure 2).

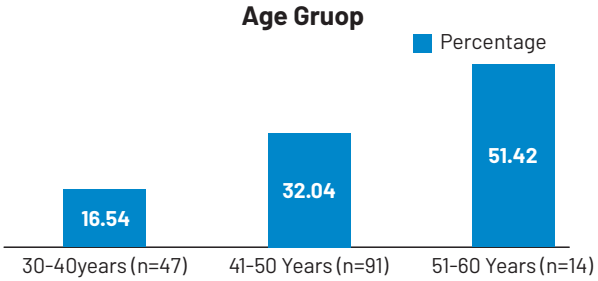

Figure 2: Patients distribution according to age group (Mean age 48.54 ± 6.53)

The study group consisted of 95 (33.46%) non-smokers and 189 (66.54%) smokers. Electrocardiogram (ECG) alterations were detected in 179 (63.02%) participants, whereas no changes were detected in 105 (36.97%) individuals. Additionally, 113 individuals (39.78%) had multi-vessel coronary artery disease, compared to 171 (60.22%) who did not (Figure 3).

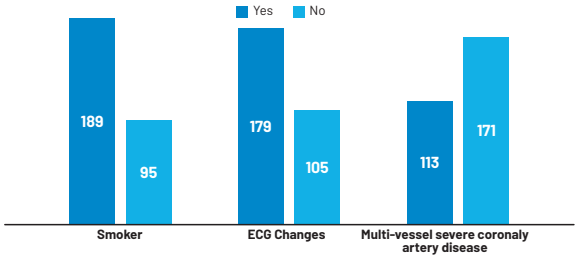

Figure 3: Smoking, MVCAD, and ECG abnormalities were all observed in the research cohort.

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When MVD was stratified according to age groups, it was noted that there was no statistically significant difference in MVD across the various age groups (p value = 0.849), and the same was true for gender stratification (p value = 0.540). Additionally, ECG abnormalities, smoking status, and MVD did not correlate with one another (p value = 0.708, p value = 0.367, res3.452 "ctively). (Table 1).

Basic Characteristics	Multi-vessel severe CAD		p- Value
	Present (n=113)	Absent (n=171)	
Gender			
Male	84	113	0.540
Female	29	58	
Gender			
30-40 year	13	19	0.849
41-50 year	41	56	
51-60 year	59	96	
Smoker			
Yes	83	119	0.367
No	30	52	
ECG changes			
Yes	71	103	0.708
No	42	68	

Table 1: Association among research demographic features and multi-vessel CAD

DISCUSSION

In the present research, we discovered that a significant number of individuals with NSTEMI who also had considerably high TropT concentrations had coronary artery bypass graft (CABG) surgery-related underlying MVD. In addition, there was no connection between MVD and smoking or age. NSTEMI is the least invasive kind of MI, which may be divided into two categories according to their severity. Only a portion of the heart muscle fed by the affected artery experiences ischemia in NSTEMI because the blood clot only partly blocks the artery. As a result, it means that in NSTEMI, the artery is not completely blocked [15-18]. The age group of the research was 30 to 60 years, with a mean age of 48.54 ± 6.53 years. The majority of the participants or 146 (51.42%), were between the ages of 51 and 60. Our average age was noticeably smaller than that of previous remote sensing studies, which may be related to the rising trend of cardiovascular illnesses in younger generations [19]. In our research, 113 individuals (39.78%) had MVCAD, but 171 participants (60.22%) had no MVCAD. In their research, Altmann *et al.*, (2013) found that 52% of participants with NSTEMI had MVCAD on average [20]. Various other studies, which comprised 210 NSTEMI individuals, indicated within 108 individuals with CTNT concentrations ten folds maximum average limit, Considerable CAD was seen in 23 (21.42%) single vessels, 39 (33%) two vessels, and 31 (29.4%) three vessels, but within 129 sick people with CTNT concentrations >ten folds maximum average limit, Significant CAD was seen in 21 (18.2%) single vessels, 35 (32.8%) double vessels, and 59 (47.1%) triple vessels [21]. Further investigations found that between 30% and 55% of NSTEMI patients had MVCAD [22, 23].

CONCLUSIONS

According to our research, many people with NSTEMI and increased troponin values also have MVCAD. Therefore, regardless of the existence or lack of ST-segment elevation on the ECG, we advise cardiac catheterization in all patients with increased troponin concentrations. Such individuals may benefit from early MVCAD diagnosis in terms of their health outcomes.

Conflicts of Interest

The authors declare no conflict of interest

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