

FREQUENCY OF TRIPLE VESSEL DISEASE IN PATIENTS WITH AND WITHOUT ANTERIOR WALL STEMI UNDERGOING CORONARY ANGIOGRAPHY

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Date of Submission: 27-04-2021; Date of Acceptance: 23-07-2021; Date of Publication: 30-07-2021

ABSTRACT:

BACKGROUND: *Among the different forms of coronary artery disease, ST elevation myocardial infarction (STEMI) has the highest in-hospital mortality. Triple vessel disease is seen commonly in STEMI patients.*

AIMS & OBJECTIVE: *To determine the frequency of triple vessel disease in patients with and without anterior wall STEMI.*

MATERIAL & METHODS: *It was a descriptive cross-sectional survey. The study was conducted in Cardiology Department, Shaikh Zayed Hospital, Lahore over a period of six months from June 9, 2018 to December 9, 2018. Total 190 cases fulfilling inclusion/exclusion criteria were recruited. Physical examination, ECG and biomarkers were done (CPK, troponin test level estimated). Blood sugar and lipid profile was done for all the patients as a routine and treated accordingly. Coronary angiography was planned and done according to departmental protocols. Frequency of triple vessel disease in these cases was recorded.*

RESULTS: *In this study, frequency of anterior wall STEMI in patients presenting with coronary artery disease was calculated as 70(36.84%). Comparison of frequency of triple vessel disease in patients with and without anterior wall STEMI presenting with coronary artery disease shows 13(10.83%) in cases without anterior wall STEMI and 45(35.71%) in anterior wall STEMI, p-value was 0.000001.*

CONCLUSION: *Triple vessel disease is more common in anterior wall STEMI as compared to those without it.*

KEY WORDS: *Coronary Artery Disease, Anterior Wall STEMI, Triple Vessel Disease.*

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Author's Contribution: MZ: Conducted the study. QAS: Audit and helped in conducting the study, wrote and reviewed and gave frequent advices, corrections and did proof reading OS: Gave frequent advice, corrections and did the proof reading also. AM: Gave frequent advice, corrections and did the proof reading also. WI and HB: Corrections and did proof reading.

INTRODUCTION

Coronary artery disease remains the major cause of mankind, in spite of a lot of developments in diagnosis, management and prevention. Population surveys indicate that coronary artery disease has increased at least two folds in last twenty years in both urban and rural population. The adult population between 25 - 65 years of age living in urban areas have got the prevalence of CAD about 90/1000 people while it is less common in rural population.¹

The death rate associated with CAD is rising in subcontinent while it has been decreasing in the west since last three decades. The prevalence of CAD has inclined from 1.1% - 7.5% in the population living in the cities and 2.1% - 3.7% in the population living in rural areas. CAD tends to occur at a younger age, with more extensive angiographic involvement contributed genetic, metabolic, conventional and nonconventional risk factors.²

Among the different forms of coronary artery disease, ST elevation myocardial infarction (STEMI) has the highest in-hospital mortality.³ A recent study reveal that anterior wall STEMI (56.78%) far exceeded the inferior wall (37.55%).⁴ Another study recorded that anterior wall STEMI is recorded in 31.3%.⁵ Another study also showed that anterior wall myocardial infarction was more 63%, inferior and or posterior wall myocardial infarction was 37% in acute ST Elevation myocardial infarction patients⁶ while another study recorded triple vessel disease in 7.95% of the cases presenting with STEMI.²

The rationale of the study was that the above studies are showing significantly variation for the frequency of anterior wall STEMI while triple vessel disease is also variant though it was not recorded in anterior wall STEMI, however, through this study we will be able to record the exact frequency of anterior wall STEMI and triple vessel disease. The results will be helpful to add results based knowledge in cardiology.

MATERIAL AND METHODS:

It was a descriptive cross-sectional study. The study was conducted in Cardiology Department, Shaikh Zayed Hospital, Lahore, over a period of six months from June 9, 2018 to December 9, 2018. A total of 190 patients fulfilling inclusion criteria (Patients of both sex group with ages in the range of 40-70 years and all diagnosed cases of coronary artery disease presenting within 24 hours of chest pain) were included. The exclusion criteria

was; patients with previous history of myocardial infarction (on history and medical record) and already under treatment of CAD (on history and medical record).

Coronary artery disease was defined as history of chest pain >30 minutes and >50% luminal stenosis in at least one lesion within main branches coronary artery. It was assessed on Coronary angiography. Anterior STEMI was defined as ST elevation at the J point in at least 2 contiguous leads of 2mm (0.2 mV) or more in men or 1.5 mm (0.15 mV) in women in leads V2-V3 and/or 1 mm (0.1 mV) or more in other contiguous limb leads. When blood supply gets compromised in left anterior descending artery (LAD), anterior myocardial tissues suffer injury which results into anterior STEMI. It was assessed on Coronary angiography. Triple vessel disease was defined as significant narrowing/ stenosis (>50%) of three coronary arteries on coronary angiography.

History and physical examination was done. After detailed history, physical examination, ECG and biomarkers were done (CPK, Troponin I test level estimated). Blood sugar and lipid profile was done for all the patients as a routine and treated accordingly. Coronary angiography was planned and done according to departmental protocols. Frequency of anterior wall STEMI and triple vessel disease in these cases were recorded.

Data was entered and computed on SPSS v25.0. Mean±S.D was calculated for age of the patients. Frequency and percentages were calculated for gender, anterior wall STEMI and triple vessel disease. Both groups were compared by chi square test taking p-value <0.05 as significant. The data was stratified for age, gender, diabetes mellitus (BSR>200mg/dl), hypertension and BMI. Post stratification chi square test was applied to control the effect modifiers. A p-value of ≤0.05 was considered statistically significant.

RESULTS:

A total of 190 cases fulfilling the inclusion/exclusion criteria were enrolled to determine the frequency of anterior wall STEMI in patients presenting with coronary artery disease and compare the frequency of triple vessel disease in patients with and without anterior wall STEMI presenting with coronary artery disease. Age distribution of the patients was done, it showed that 126(66.32%) were between 40-55 years of age whereas 64(33.68%) were between 56-70 years of age, mean age was calculated as 52.27±6.83 years.

Table No. 1 Age and Gender distribution (n=190)

		No. of patients	%	Mean±S.D
Age (in years)	40-55	126	66.32	52.27±6.83
	56-70	64	33.68	
Gender	Male	98	51.58	
	Female	92	48.42	

Table no. 2: Comparison of frequency of triple vessel disease in patients with and without anterior wall STEMI undergoing coronary angiography (n=190)

Triple vessel disease	With anterior wall STEMI (n=70)		Without anterior wall STEMI (n=120)		P value
	No. of patients	%	No. of patients	%	
Yes	25	35.71	13	10.83	0.000
No	45	64.29	107	89.17	
Total	70	100	120	100	

Table-3: Stratification with regards to age, gender, BMI, diabetes mellitus and hypertension

		Anterior wall STEMI		P value
		Yes	No	
Age (in years)	40-50	51	75	0.14
	51-70	19	45	
Gender	Male	41	57	0.14
	Female	29	63	
BMI	≤30	37	78	0.09
	>30	33	42	
DM	Yes	38	56	0.31
	No	32	64	
HTN	Yes	32	60	0.56
	No	38	60	

Gender distribution shows that 98(51.58%) were male and 92(48.42%) were females. (table-1) Mean BMI of the patients was calculated as 29.61 ± 2.69. Frequency of Anterior Wall STEMI in patients presenting with coronary artery disease was calculated as 70(36.84%), whereas 120(63.16%) had no findings of anterior wall STEMI.(table-2)

Comparison of frequency of triple vessel disease in patients with and without anterior wall STEMI presenting with coronary artery disease shows 13(10.83%) in cases without anterior wall STEMI and 45(35.71%) in anterior wall STEMI, p-value was 0.000001.(table-2) The data was stratified for age, gender, diabetes mellitus (BSR>200mg/dl), hypertension and BMI.(table-3) Post stratification chi square test was applied to control the effect modifiers. P-value of ≤0.05 was considered statistically significant.

DISCUSSION:

Coronary Artery Disease (CAD) is the leading cause of death, with 7,200,000 deaths per year, or 12 percent of all deaths worldwide.⁷ CAD is a major cause of death in many developing countries.⁸ Acute coronary syndromes are currently classified according to the presence or absence of ST elevation at hospital admission.

Acute occlusion in coronary arteries is associated with ST elevation. Due to the occlusion in LAD, anterior wall myocardium suffers injury and it reflects anterior STEMI.

When anterior wall MI extends into the septal and lateral territories, left main coronary artery and proximal LAD might be considered culprit and this is called an extensive anterior MI. The severe form of the coronary atherosclerosis is three vessels CAD. According to guidelines, left main coronary artery along with three vessel CAD is considered

high-risk.⁹ Three vessel CAD is associated with worse long term treatment as compared to less severe CAD.¹⁰⁻¹²

This study recorded the frequency of anterior wall STEMI while triple vessel disease is also variant and not recorded in anterior wall STEMI, however, through this study we planned to record the exact frequency of anterior wall STEMI and triple vessel disease. The results may be helpful to add results based knowledge in cardiology.

In our study, out of 190 cases, 66.32%(n=126) were between 40-55 years of age whereas 33.68%(n=64) were between 56-70 years of age, mean age was calculated as 52.27+6.83 years, 51.58%(n=98) were male and 48.42%(n=92) were females, frequency of Anterior Wall STEMI in patients presenting with coronary artery disease was calculated as 36.84%(n=70). Comparison of frequency of triple vessel disease in patients with and without anterior wall STEMI presenting with coronary artery disease shows 10.83%(n=13) in cases without anterior wall STEMI and 35.71%(n=45) in anterior wall STEMI, p-value was 0.000.

A recent study reveal that anterior wall STEMI (56.78%) far exceeded the inferior wall (37.55%).⁴ Another study recorded that anterior wall STEMI is recorded in 31.3%.⁵ while another study recorded triple vessel disease in 7.95% of the cases presenting with STEMI.²

The findings of our study are in agreement with the above studies regarding the frequency of anterior wall STEMI in CAD cases and falls in the

range of above studies, however, we found a higher rate of triple vessel disease in cases with anterior wall STEMI as compared to those without it.

Another study by Ravishankar MS and others¹³ studied the clinical manifestations and outcome of thrombolytic therapy in STEMI and recorded 58% of the cases with anterior wall STEMI which is more than recorded in our study. Kazazi EH and others¹⁴ compared the severity and extension of coronary involvement in inferior and anterior MI and recorded 33.4% of the cases with triple vessel disease in anterior MI. They assessed that according to angiographic database, inferior wall MI is also very significant due to the involvement of number of coronary arteries whereas anterior wall MI is linked with more severity of CAD.

Considering the above data, we are of the view that frequency of anterior wall STEMI is higher in CAD while triple vessel disease is more common in anterior wall STEMI as compared to those without it. However, the prime objective of our study was to record the frequency of these variables only, however, in further trials, we may compare the clinical outcome in these cases.

CONCLUSION:

Frequency of anterior wall STEMI is higher in CAD while triple vessel disease is more common in anterior wall STEMI as compared to those without it and therefore having more severe disease. Therefore we should treat and manage these patients more aggressively with medicine, angioplasty with stenting or early CABG (Coronary Artery Bypass Graft) surgery.

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