Myocardial Infarction in young Patients

Abdul Ghaffar Memon, Farazul Haque Shaikh, Muhammad Khalid Shaikh

ABSTRACT

BACKGROUND: Coronary artery disease (CAD) has a predilection for older age. However, both in developed and developing countries, an epidemiological shifts for CAD is observed and now it is more frequently seen in young adult population, but there is paucity of data regarding emerging clinical picture. Therefore, the present study was designed to determine the percentage of patients at 45 years of age and below afflicted with myocardial infarction. The study was also aimed to determine the sex distribution, associated risk factors and clinical features in young patients.

METHODS: This descriptive study conducted through convenient sampling technique at Coronary Care Unit of Liaquat University Hospital, Hyderabad and on all patients admitted with acute myocardial infarction during the period of one year to determine the frequency of acute myocardial infarction among younger patients aged≤ 45 years, and its associated risk factors.

RESULTS: The overall prevalence of acute myocardial infarction among young adults was 46.80%. The mean age of study subjects was 37.63 ±6.26 years; male outnumbered (80.7%, n= 71) female(19.3%, n=17). Most of the patients belongs to age group between 41 – 45 years (40.9%, n= 36) and the most common underlying condition that may linked to myocardial infarction was cigarette smoking (65.9%, n= 58). Out of total 88 patients the mortality rate was (12.5%, n= 11) and ventricular arrhythmias were the most common (6.8%, n=6) complication.

CONCLUSION: The acute myocardial infarction is not uncommon in younger aged male smokers.

KEYWORDS: Coronary Artery Disease (CAD), Myocardial infarction (MI), Ventricular Arrhythmias .

INTRODUCTION

Acute Myocardial Infarction (AMI) developed due to an abrupt decrease or cessation of blood flow in a major coronary artery as a result of many factors including thrombotic occlusion in an already narrowed atherosclerotic artery[1]. Stenosis developing slowly in the proximal portion of major epicardial arteries is likely to develop collateral network that reduce frequency of MI. Instead, AMI results from rapid development of thrombus in a coronary artery at the site of vascular injury and there may be other factors like vasoconstriction, small vessel, and it could be congenital or chromosomal. The factors responsible or facilitating such an injury include cigarette smoking, lipid accumulation, and hypertension. Frequently, infarction results when there is fissuring, rupture, or ulceration of atherosclerotic plaque and when conditions (local or generalized) favor thrombus formation at the site of injury, which results into coronary artery occlusion[2,5].

Myocardial infarction is part of a much broader group disorders known as Acute Coronary Syndrome (ACS). This group consists of patients with ongoing compromised blood supply and injury to myocardium resulting in unstable angina, initially non-ST-segment elevation myocardial infarction (NSTEMI), and then ST-segment elevation myocardial infarction (STEMI)[6].

The long term complications of myocardial infarction may include systolic and diastolic dysfunction and an increased likelihood of arrhythmias. An important breakthrough in managing acute myocardial infarction has been the advent of coronary thrombolytic therapy and mechanical revascularization, which if implemented early, at least within 6 hours, after the onset of ischemia can prevent irreversible damage to the myocardium[7].

The objectives of the study includes to determine the frequency of and clinical pattern of AMI in patients at 45 years of age and below, and to identify frequency of associated risk factors.

MATERIAL & METHODS

This descriptive cross sectional study conducted through convenient sampling technique in cardiology department of Liaquat University Hospital Hyderabad, over a period of one year from January 2012 to December 2012.

Patients admitted in CCU with confirmed diagnosis of MI (through history, ECG and enzyme estimation) were enrolled after obtaining their informed consent. The data was collected regarding baseline characteristics of acute MI patients of younger age group and associated risk factors were identified from the history and physical examination.

The data collected was subjected to statistical analysis through Statistical Package for Social Sciences (SPSS) version 16.0. Percentage of discrete variable was calculated. For continuous variable, data was presented as Mean ± Standard Deviation. As frequency of risk factors was calculated only, chi-square test was used to determine the association among categorical variables.

RESULTS

Among 188 patients of AMI during period of study, 88 patients were aged 45 years or less with a prevalence of 46.80% (n=88) among young patients. The mean age of study subjects was 37.63 ±6.26 years, male (80.7%,n=71) outnumbered female (19.3%,n=17) patients.

The stratification of different age groups is presented in Table I. Most of the patients belongs to age group between 41 – 45 years (40.9%, n= 36). Table II shows underlying condition (s) that may be linked with myocardial infarction in younger population. Cigarette smoking is the most common (65.9%, n= 58) risk factors observed in our study population.

Poor prognostic factors among these young patients were also evaluated in our study. Out of total 88 patients the overall mortality rate was (12.5%, n=11) and ventricular arrhythmias were the most common (6.8%, n=6) reported cause of mortality among these patients (Table III).

TABLE I: FREQUENCY DISTRIBUTION OF AGE GROUPS (n=88)

Age (Years)	Frequency (n)	Percentage (%)
16 – 20	1	1.1%
21 – 25	3	3.4%
26 – 30	9	10.2%
31 – 35	13	14.8%
36 – 40	26	29.5%
41 – 45	36	40.9%
Total	**88**	**100%**

TABLE II: FREQUENCY DISTRIBUTION OF UNDERLYING COMORBIDS (n=88)

	YES		NO	
	(n)	(%)	(n)	(%)
Smoking	58	65.9%	30	34.1%
Diabetes Mellitus	30	34.1%	58	65.9%
Hypertension	37	42.0%	51	58.0%
Hyperlipidemia	33	37.5%	55	62.5%
Mean BMI	47	53.4%	41	46.6%
Family History	23	26.1%	65	73.9%
Cholesterol	35	39.8%	53	60.2%
HDL	25	28.4%	63	71.6%
LDL	26	29.5%	62	70.5%

TABLE III: FREQUENCY DISTRIBUTION OF CAUSE OF MORTALITY (n=88)

	YES		NO	
	(n)	(%)	(n)	(%)
All Causes	1	1.1%	87	98.9%
Congestive Heart Failure	2	2.3%	86	97.7%
Arrhythmias VT and VF	6	6.8%	82	93.2%
Cardiogenic Shock	2	2.3%	86	97.7%

DISCUSSION

For last many decades' Cardiovascular diseases have been among leading cause of mortality across the globe. World health organization (WHO) data suggests that the cardiovascular diseases are causing significant disturbances in the Disability adjusted life years (DALYs), it is about 10% of DALYs in

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socioeconomically deprived countries while it rises to about 18% of DALYs in socioeconomically advanced countries[8-10].

Cardiovascular diseases are typically middle or old age pathologies; however a shift in age prevalence of cardiovascular diseases has been noticed. Most influencing risk factors which are acquired in childhood and in adolescence are unhealthy eating habits and tobacco smoking. However in our research study, contrary to the literature findings, the patients with MI at a younger age were found to be similar to older patients in many aspects. Total 88 patients were included in the study. Among them, frequency of acute MI in younger age group i.e. less than 45 years was 46.80%. The frequency seen in our study seems to be in concordance with the study conducted in India[11], However, in comparison with internationally published literature the frequency is on higher side[12,13]. The reason for higher frequency in comparison with the internationally published data may be due to the fact that the reported mean age for MI among south Asians population is relatively lower in comparison to non south Asian population.

Many reasons and independent risk factors have been attributed to this higher prevalence among south Asian population, most common factors are tobacco smoking, the usage of saturated cooking oil (Banaspti Dalda), diabetes and hypercholesteremia, parental consanguinity, family history of cardiovascular disease, low socio-economic status, and illiteracy[14,15].

The mean age in 88 patients was 37.63 ±6.26 years. Our results validated findings of various other studies done on local cohort which showed almost identical mean age of AMI patient in younger population [12,13].

Various risk factors were studied in the study population and were compared with those reported in literature. Smoking came out to be the most common risk factor in the study population (68.05%). Various studies done in AMI patients report this as one of the commonest and independent risk factor[16].

Published data shows that smoking causes myocardial infarction in patients having minimal atherosclerosis. Surprisingly this triggering effect of smoking was also noted in smokers having normal coronary arteries, especially among the young smokers. Smoking can cause thrombus formation and or coronary artery spasm resulting in temporary coronary vessel occlusion leading to myocardial infarction[17].

CONCLUSION

Acute myocardial infarction in younger aged, smoker male is not uncommon and should always be considered in differential diagnosis.

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AUTHOR AFFILIATION:

Dr. Abdul Ghaffar Memon *(Corresponding Author)*
Department of Cardiology
Liaquat University of Medical & Health Sciences
(LUMHS), Jamshoro/Hyderabad, Sindh-Pakistan.
Email: gmemon680@gmail.com

Dr. Farazul Haque Shaikh
Department of Cardiology
LUMHS, Jamshoro/Hyderabad, Sindh-Pakistan.

Dr. Muhammad Khalid Shaikh
Department of Medicine
LUMHS, Jamshoro, Sindh-Pakistan.