

DIABETES AS A RISK FACTOR OF IN – HOSPITAL MORTALITY IN PATIENTS WITH PREMATURE CORONARY DISEASE PRESENTING WITH ACUTE MYOCARDIAL INFARCTION.

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Abstract;

Background; Recent data from various parts of the world have led to the conclusion that more than 80 % of CVD deaths occur in developing countries like Pakistan. This high burden of heart diseases is largely attributed to the industrial and technological progress which is associated with economic and social transformations which have led to life style modification and sedentary life style. This study was planned to ascertain mortality rate of premature coronary artery disease in patients with AMI as it directly affects main workforce of our national economy. **Objective;** To determine role of diabetes with mortality in premature coronary artery disease patients with acute myocardial infarction. **Material and methods;** A total of 145 patients having premature coronary artery disease presenting with acute myocardial infarction were included in this descriptive study. This study was conducted in the department of medicine, Nishtar Hospital, Multan from June 2018 to May 2019. These patients were followed during current hospitalization to see mortality in these patients and all the findings were noted in the proforma. **Results;** Of these 145 study cases, 96 (66.2%) were male patients and 49 (33.8%) were female patients. Mean age of our study cases was noted to be 47.67 ± 7.59 years. Mean time taken before presentation at hospital was 113.79 ± 54.36 minutes. Hypertension was present in 58 (40%), smoking in 39 (26.9%), family history of IHD in 67 (46.2%) and obesity in 49 (33.8%) of our study cases. Mortality was noted to be in 19 (13.1%) of our study cases, post MI angina was seen in 36 (24.8%) and cardiogenic shock was noted in 29 (20%). Diabetes was present in 48 (33.1%) of our study cases while in – hospital mortality among diabetic patients was 18 /48 (37.5%) ($p=0.001$). **Conclusion;** Our study results indicate that diabetic patients with premature coronary artery disease having acute myocardial infarction (AMI) have high rates of mortality. Positive family history, hypertension, obesity and diabetes were major risk factors noted in our study. Life style modification and early screening of the cases with positive family history in first degree relatives can help prevent heart diseases in our population as it hits main workforce and has negative impact on national productivity.

Keywords; Premature coronary artery disease, mortality, diabetes, Myocardial infarction.

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Introduction;

Ischemic heart disease (IHD) is one of the major causes of morbidity and mortality world wide¹⁻⁵. The prevalence of Myocardial infarction (MI) is more in the middle income world; and it is well known that males are more commonly affected than females^{6, 7}. Myocardial ischemia caused by atherosclerotic CAD usually manifests itself in terms of acute myocardial infarction (AMI) and unstable angina⁸. In emergency department admissions, acute myocardial infarction is more dangerous and commonly encountered life threatening illness^{9, 10}.

Due to the rapid advancements in recent life saving technologies and use of sophisticated equipments/procedures, death rates have dropped down over 30 % in previous 2 decades. However these mortality rates are reported to be still high, emphasizing the need for more effort in this area which will target

early presentation to the emergency care setting followed by proper management¹¹. In our country, due to high prevalence of hypertension, smoking and increasing trends in obesity have led to the increase in cardiovascular risk factors¹².

Coronary artery disease which manifests itself at younger ages may lead to adverse consequences for the sufferers, their families and whole society as it hits patients in ages of 35 – 65 years which comprises of workforce of the nation. Moreover, CAD are observed in Asian patients who are 10 years younger than their western counterparts. The mean age for first presentation of acute myocardial infarction in Indians is 53 years¹³.

In young patients with premature coronary artery disease cardiogenic shock has been reported to be 12 %¹⁴. Khan et al¹⁵ reported mortality 11.8 % with premature coronary artery disease while post MI angina was 10.46 %¹⁵.

Prevention of deaths particularly in young people becomes nation's moral responsibility. This study has been proposed to document mortality rate of premature coronary artery disease in patients of AMI as there was no such study conducted in our population. The results of this study generated baseline database of our local population and findings were compared with that of already existing literature from different countries. Decreasing morbidities and mortalities in this age group are beneficial for national economies.

Material and methods;

A total of 145 patients having premature coronary artery disease presenting with acute myocardial infarction were included in this descriptive study. This study was conducted in the department of medicine, Nishtar Hospital, Multan from June 2018 to May 2019. These patients were followed during current hospitalization to see mortality in these patients and all the findings were noted in the proforma. Patients of either sex having ages for males (25 – 55 years) and for female patients (25-65 years) with acute myocardial infarction were included. AMI was defined as “patients presenting with retrosternal pain having ECG evidence of persistent ST segment elevation of > 2mm in more than 2 contiguous chest leads followed by T wave inversion”. Patients having previous history of infarction, patients having chronic renal failure and liver cirrhosis, Patients with advanced heart failure, patients with history of coronary artery bypass surgery were excluded from our study. All patients were given thrombolytic therapy (Injection Streptokinase 1.5 million units over one hour) and each patient was monitored through serial ECGs and echocardiography till discharge from the hospital to see mortality and data was entered in SPSS-18. Descriptive statistics were applied to calculate mean and standard deviation for the age of the patients and time taken before presentation. Frequencies and percentage were tabulated for the categorical variables like age groups, gender, mortality, family history of IHD, diabetes, smoking and hypertension. Confounders like age, diabetes, time taken before presentation to hospital, smoking, family history of IHD, Hypertension and gender were controlled by stratification of data.

Results;

Of these 145 study cases, 96 (66.2%) were male patients and 49 (33.8%) were female patients. Mean age of our study cases was noted to be 47.67 ± 7.59 years. Mean time taken before presentation at hospital was 113.79 ± 54.36 minutes (with minimum time taken before presentation was 45 minutes while maximum time taken before presentation was 240 minutes) and 77 (53.1%) consumed more than 90 minutes to reach the hospital. Hypertension was present in 58 (40%), smoking in 39 (26.9%), family history of IHD in 67 (46.2%) and obesity in 49 (33.8%) of our study cases. Mortality was noted to be in 19 (13.1%) of our study cases. Diabetes was present in 48 (33.1%) of our study cases while in – hospital mortality among diabetic patients was 18 /48 (37.5%) ($p=0.001$).

Discussion;

Recent data from various parts of the world have led to the conclusion that more than 80 % of CVD deaths occur in developing countries like Pakistan. This high burden of heart diseases is largely attributed to the industrial and technological progress which is associated with economic and social transformations which have led to life style modification and sedentary life style¹⁶. This study was planned to ascertain mortality rate of premature coronary artery disease in patients with AMI as it directly affects main workforce of our national economy. Our study included a total 145 premature coronary artery disease having acute myocardial infarction meeting inclusion and exclusion criteria were included in this study. Different studies have associated premature coronary

artery disease to be more frequent in men than that of women¹⁷. Similarly our study results have shown that 96 (66.2%) were male patients and 49 (33.8%) were female patients. Khan et al¹⁵ reported women in 1994 were 27 % which increased to 39 % in 2004. Ahmed et al¹⁷ also reported male gender predominance with 88 %. Qadri et al¹⁸ reported 70 % male patients. Another study from Bangladesh by Karim et al¹⁹ reported 68 % male gender predominance which is close to our study results.

Mean age of our study cases was noted to be 47.67 ± 7.59 years (range; 35 – 63 years). Mean age of the male patients was 45.77 ± 5.98 years while that of female patients was 51.39 ± 8.99 years ($p = 0.000$). Khan et al¹⁵ reported mean age to 49.70 in 1994 which dropped to the 47.38 years, similar to our results. Similar findings have also been documented by Karim et al¹⁹ from Bangladesh.

Time taken before presentation to the hospital plays a key role in the management of patients with myocardial infarction, however this practice is neglected in our society and people tend to present late which adds up to the complications and adverse clinical outcomes. Mean time taken before presentation at hospital was 113.79 ± 54.36 minutes (with minimum time taken before presentation was 45 minutes while maximum time taken before presentation was 240 minutes) and 77 (53.1%) consumed more than 90 minutes to reach the hospital.

Diabetes was present in 48 (33.1%) of our study cases. Ahmed et al¹⁷ reported 31 % diabetes in AMI patients with premature CAD, close to our results. Qadri et al¹⁸ reported 29.5 % diabetes, close to our results. Karim et al¹⁹ reported bit high rate of diabetes to be 46 % while Ertelt et al²⁰ reported 17.5 % diabetes.

Hypertension was present in 58 (40%) while Ahmed et al¹⁰⁴ reported 35 % hypertension in premature CAD patients having AMI. Qadri et al¹⁸ reported 45 % hypertension in patients with CAD while a study conducted by Noeman et al²¹ also reported 51 % hypertension supporting our findings. Karim et al¹⁹ reported very high frequency of hypertension to be 76 % which is quite high than our study results.

Smoking is a major risk factor in the development of CHD among young people and different studies have related smoking with premature coronary artery disease, smoking was positive in 39 (26.9%) our study cases. Ahmed et al¹⁷ reported quite high proportion of smoking to be 79 % which is much higher than our study results. The reason for this difference may be due to small sample size of their study ($n=52$) as well as very high proportion on male gender (i.e. 87%) because in our study all smokers were male patients. Qadri et al¹⁸ reported 49 % smoking which is again higher proportion of smoking.

Family history positive for IHD in first degree relatives has been traditionally associated risk factor which increases their chances for future coronary artery disease. Family history of IHD in 67 (46.2%) while Ahmed et al¹⁷ reported 17 % which is quite lower, again may be due to their small sample size of only 52. Qadri et al¹⁸ reported 32 % positive family history which is close to our findings. Karim et al¹⁹ 34 % positive family history which is similar to our study results.

obesity in 49 (33.8%) of our study cases while a study conducted by Noeman et al²¹ reported 35 % obesity in patients with premature coronary artery disease which is close to our findings. Karim et al¹⁹ reported 44 % obesity which is similar to that of our stud results.

Mortality was noted to be in 19 (13.1%) of our study cases and 37.5 % among diabetic patients while it was significantly associated with diabetes ($p=0.001$). A study conducted by Khan et al⁸ reported mortality in 1994 was 10.65 % which increased to 11.8 % in 2004, these results are similar to that of our study results. Karim et al¹⁰⁶ reported 12 % mortality which is close to our study results.

Conclusion;

Our study results indicate that diabetic patients with premature coronary artery disease having acute myocardial infarction (AMI) have high rates of mortality. Positive family history, hypertension, obesity and diabetes were major risk factors noted in our study. Life style modification and early screening of the cases with positive family history in first degree relatives can help prevent heart diseases in our population as it hits main workforce and has negative impact on national productivity.

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