

EFFECT OF GENDER ON THE OUTCOME OF ACUTE CORONARY SYNDROME IN TYPE 2 DIABETES MELLITUS

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INTRODUCTION

Although the majority of wealthy nations have witnessed a reduction in cardiovascular mortality, cardiovascular disease remains a significant cause of morbidity and mortality.^{1,2} Type 2 diabetes and impaired glucose tolerance are two serious risk factors emerging quickly. Globally people with diabetes are predicted to double in the coming 30 years.^{3,4} Approximately 75% of type 2 diabetic patients die from cardiovascular disorders. Based on specific epidemiologic studies, individuals who have diabetes have a four times higher chance of mortality from cardiovascular disease (CVD).⁵ Studies have revealed a substantial gender disparity in the incidence and prognosis of acute myocardial infarction (MI) and coronary artery disease (CAD). Women are inclined to have potential risks such as systemic hypertension and diabetes mellitus.⁶ Research indicates that mortality rates in women following acute myocardial infarction were lower or comparable to those in males. However, mortality rates six months post-MI in women remained higher than in men. The increased average age of the patient group female patients may be to

blame for this.⁷ The worst prognosis in females may have been triggered by the trifecta of coronary artery disease, obesity, and diabetes mellitus.⁸ Though after menopause, women typically have a lower risk of acquiring coronary heart disease than men, despite the presence of some disorders, disparities in relative survival between men and women either vanish or change. Some studies suggest that while the probability of having CVD nearly doubles in men, it is four times more likely in females with diabetes.^{9,10} The fact may be that diabetic women experience CVD at a later stage than non-diabetic women, making their CVD risk comparable to that of diabetic men. Moreover, young diabetic women are reported to be at greater risk.¹¹ Furthermore, therapy for co-morbidities such as heart failure following a MI is usually delayed in women compared to males, primarily in the diabetic group.¹² Diabetes has been associated with higher long-term mortality in women, but the relationship to increased mortality in the short term is less established.¹³ After controlling potential confounders such as hypercholesterolemia and smoking, it was revealed that the relative risk of death from ischemic heart disease was increased for diabetes men. However, it was three

ABSTRACT

OBJECTIVES

To determine the frequency of acute coronary syndrome presentations among diabetic patients and in-hospital outcomes based on gender variance.

METHODOLOGY

This observational cross-sectional study was conducted at the cardiology department of the Pakistan Institute of Medical Sciences, Islamabad. 106 consecutive diabetic patients with acute coronary syndrome were enrolled. Patients were assessed for in-hospital outcomes like congestive heart failure, recurrent angina, and mortality. The outcomes were evaluated based on gender. The Chi-Square test was used for significant differences keeping the P-Value <0.05.

RESULTS

The mean age of the patients was 57.75±8.16 years. Males were 57 (53.8%), and females were 49 (46.2%). Congestive heart failure, re-angina, and mortality were significant in both genders yielding a P value of <0.05.

CONCLUSION

Diabetes is an important predictor of acute coronary syndrome. The complications related to congestive heart failure and mortality are more prevalent in males than females.

KEYWORDS: Acute Coronary Syndrome, Type 2 Diabetes, Diabetes Mellitus.

times greater in diabetic women than non-diabetic control participants.^{12,13} Studies on the gender differences in how diabetes influences Acute myocardial infarction (AMI) are limited, whereas there is a dearth of information on how diabetes affects cardiovascular diseases in the short to mid-term. This study is carried out to establish the frequency of various acute coronary syndrome presentations among diabetic patients and in-hospital outcomes based on gender variance.

METHODOLOGY

This observational cross-sectional study was conducted in the cardiology ward of PIMS after taking ethical approval from the hospital's ethical board. Non-probability consecutive sampling was used for data collection. The sample size was calculated using the OpenEpi online tool, taking into account the previous frequency of mortality rate of 11.08%, a margin of error of 6%, and a confidence interval of 95%. Diabetic patients aged between 40 to 70 years, both genders, with acute coronary syndrome and troponin concentrations of 0.40 ng/mL and higher were enrolled in the emergency department after initial assessment. Patients having noncardiac chest pain and comorbid other than hypertension were excluded. All the demographic data was recorded on a predesigned proforma. Complications like congestive heart failure, recurrent angina, and mortality were assessed. All the data were analyzed using IBM SPSS-24. Numerical variables were presented as mean and standard deviation. Categorical variables were presented as frequencies and percentages. The chi-Square test was used to compare the outcomes between genders. Statistical significance was determined using a P value < 0.05.

RESULTS

There were 106 diabetics with acute coronary syndrome (ACS) included in the study. The mean age of the patients was 57.75±8.16 years. There were 57 (53.8%) males, 62.3% were hypertensive & 16% had a family history of ACS. ST segment myocardial infarction (NSTEMI) was in 51 patients; 16 (15.1%) had non-STEMI, 12 (12.3%) had unstable angina and 11 (10.4%) patients presented with stable angina. Anterior MI was in 28.3%, while 19.8% had inferior MI. The complications related to coronary artery disease concerning gender can be seen in Table no. I through Table III.

Table 1: Congestive Cardiac Failure and Gender

		Patients with Congestive Heart Failure		Total Patients Evaluated	P-Value
		Yes	No		
Gender	Male	25 43.9%	32 56.1%	57 100.0%	0.02
	Female	11 22.4%	38 77.6%	49 100.0%	
Total		36 34.0%	70 66.0%	106 100.0%	

Table 2: Recurrent-Angina and Gender

		Re-Angina		Total	P-Value
		Yes	No		
Gender	Male	11 19.3%	46 80.7%	57 100.0%	0.01
	Female	20 40.8%	29 59.2%	49 100.0%	
Total		31 29.2%	75 70.8%	106 100.0%	

Table 3: Genderwise Mortality

		Mortality		Total	P-Value
		Yes	No		
Gender	Male	9 15.8%	48 84.2%	57 100.0%	
	Female	2 4.1%	47 95.9%	49 100.0%	
Total		11 10.4%	95 89.6%	106 100.0%	

DISCUSSION

Patients with diabetes experience all CAD symptoms, including myocardial infarction (MI), at least twice as frequently as patients without diabetes. Approximately 75% of people with diabetes die of coronary artery disease (CAD). The mortality rate from coronary heart disease is declining in non-diabetics but not as much in diabetic ones. Since the prevalence of diabetes mellitus (DM) is rising exponentially and is predicted to reach 7079 people per 100,000 by 2030, DM is anticipated to play a major role in CAD-related mortality than it did in the past.¹⁴ Patients with DM have higher cardiovascular morbidity and mortality, which is widely known. The three main causes of death associated with macrovascular disorders of diabetes are CAD, cerebrovascular disease, and peripheral artery disease. Type 2 diabetics are prone to heart problems as well.¹⁵ The main cause of increased mortality and a shorter lifespan in DM patients is an elevated cardiovascular risk. Compared to non-diabetic patients, patients with DM type 2 had an 8-year shorter life expectancy at age 40. A significant risk factor for the emergence of CAD is diabetes. In contrast to non-diabetic patients, coronary arteries in diabetes patients exhibit widespread

and diffuse atherosclerosis, longer lesions, and more complex lesions.¹⁶ According to US population research, people with DM have a greater prevalence of acute myocardial infarction (MI) than those without diabetes, with a relative risk of myocardial infarction (MI) that is 50% higher in diabetic males and 150% higher in diabetic women.¹⁷ Patients who have type 2 Diabetes are just as susceptible to cardiac events as people who have already experienced a MI. In people with diabetes, the chance of a MI recurrence is greater than 40%. Adults with diabetes will experience a loss of 30 years of quality-adjusted life compared to those without diabetes because of the increased prevalence of acute MI in diabetic patients.¹⁸ Our study was conducted on 106 diabetic patients of both genders. The mean age of the patients at presentation was 57.75±8.16 years. Our study had 57 (53.8%) males and 49 (46.2%) females. A study⁹ conducted in Pakistan showed similar demographic findings having mean age at presentation 60.64±9.24 years with 55.9% males and 44.1% females. In our study, 16% of patients had a family history of CAD, and 62.3% were hypertensive at the time of presentation. Our findings show that Pakistani patients show a similar pattern to one study, which reported 67.2% of diabetic patients having hypertension and 12.6% having a family history of CAD.¹⁹ In this study, we found that the frequency of CAD in males was comparable with females without any significant difference except stable angina. Upon stratification, we observed that male patients had higher rates of stable angina than females, and the difference was statistically significant. Another institute in Pakistan reported an almost similar pattern in their findings.⁹ Regarding the outcomes of CAD, there was a significant gender-wise difference. Congestive heart failure was observed in 43.9% of males and 22.4% of females, re-angina was observed more in the female patients as compared to the male patients (19.3% vs 40.8%) and mortality was higher in the male patients as compared to female patients (15.8% vs 4.1%). Our results concur with the aforementioned Pakistani study.⁹ It similarly revealed that the risk of mortality is 2.58% in diabetic males and 1.58% in females, which is again in correspondence with our analysis regarding the mortality rate of CAD in diabetic patients based on gender. Our single-centre-based study was conducted on most patients who were uneducated about their condition and unaware of maintaining a proper medical history of their cardiovascular disease. Apart from the limitation, certain aspects like diabetic and cardiovascular medications were not considered during our study. These factors may have affected our results.

LIMITATIONS

It was a single-centred study. We suggest a proper

follow-up of the patients and multi-centre studies be conducted for more accurate interpretations regarding the gender-based association between diabetes and ACS.

CONCLUSIONS

We conclude that diabetes is a critical predictor of acute coronary disease. The complications of ACS in terms of congestive heart failure and mortality have higher frequencies in male patients than female patients.

CONFLICT OF INTEREST: None

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