ORIGINAL ARTICLE

Association between Silent Myocardial Ischemia and Duration of Diabetes among Diabetics

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ABSTRACT

Background: Today's global health issue is diabetes which is either due to insulin insufficiency or decrease insulin utilization by body. Cardiovascular event usually associated with diabetes is usually silent myocardial ischemia.
Aim: To determine the association between cardiovascular event (silent MI)with duration of diabetes.
Methodology: Current survey held at Mayo Hospital, Lahore, from January-June 2011. In this study, patients enrolled (325) having both genders with age (35-65years). All Patients were considered for Exercise Tolerance test (ETT) after ruling out any symptom regarding myocardial ischemia. Collected data was analyzed by SPSS version 17. Mean ± SD was given for duration of diabetes. Percentage was given for gender and silent MI among subjects enrolled. Chi square test applied post stratification with p value ≥0.05 was considered significant.
Results: Mean age of the patients was 49.92±5.55 years. Males (60.3%) whereas females were (39.7%) enrolled. Mean duration of diabetes in enrolled subjects turned out to be 10.04±4.61 years. Among 325 patients, 58% patients had silent myocardial ischemia with duration of diabetes above 10years.
Conclusion: We concluded that risk of cardiovascular event (silent MI) increases with increase in duration (years) of diabetes.
Keywords: Myocardial Ischemia, Type 2 Diabetics and Exercise Tolerance Test.

INTRODUCTION

Today's global health issue is diabetes which is either due to insulin insufficiency or decrease insulin utilization by body. A consequence of this is hyperglycemia.[1] Globally, it is estimated that 347 million people have Diabetes[2]. As predicted by WHO, diabetes by 2030will become the seventh principal cause of death among individuals[3]. Type 2 diabetes (90%) is more common as compared with type 1 diabetes among diabetics worldwide[1]. Among Pakistani population, it's prevalence is 9.1% due to many reasons like genetics, life styles and eating habbits[4].

According to one study, myocardial infarction comprises 20-50% of cases among asymptomatic diabetics[5]. However, another study claims that it's incidence among asymptomatic diabetics is just 2.9%[6]. Chronic diabetes is associated with complex complications. It mainly affects retina, kidneys, nerves and cardiovascular system as reported previously[7].

Cardiac issues are the leading cause of death among them as reported by literature review. Silent myocardial ischemia occurs commonly among large number of diabetic patients. Asymptomatic diabetic patients (5-30%) usually present with changes in ECG and cardiac markers[8]. Even after maximum exercise silent myocardial ischemia can present asymptomatically in type 2 diabetics.

We planned this study as scanty data is available regarding effect of duration of diabetes on cardiovascular events among Pakistani population. Hence, the purpose of this study was to determine the association between silent myocardial ischemia (MI) and duration of diabetes among diabetics. If association turns out to be significant between them then early management and intervention should be planned as routine.

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METHODOLOGY

The sample size of 325 was estimated by taking 95% confidence level with 5% margin of error and proportion of silent MI among diabetics as 30%. This study was held in Department of Medicine, Mayo Hospital, Lahore from January-June 2011 following approval from the Hospital's ethical committee. Non-probability consecutive sampling was adopted. Cases fulfilling the inclusion criteria like history of diabetes mellitus for more than 5 years, normal ECG, both genders with age range of 35 to 65 years were enrolled throughout project. Written informed consent was taken. Exclusion criteria included patients with any previous heart disease, UTI and pregnant females. Silent myocardial ischemia was determined by exercise tolerance test (ETT). All the Patients had ETT after ruling out any symptom regarding myocardial ischemia.

Statistical analysis: Collected data was analyzed by SPSS version 17.0. Duration of diabetes was described as mean with standard deviation. Frequencies and percentages were calculated for gender and silent myocardial ischemia among enrolled subjects. Data was stratified by duration of diabetes to deal with effect modifier. Chi square applied with significant p value ($\leq$ 0.05).

RESULTS

In this study, 325 cases of diabetes were included. Parameters like gender, age and duration of diabetes were noted at the time of enrollment. Mean age of the patients was 49.92±5.55 years. Mean duration of diabetes in patients was 10.04±4.61 (range: 5.0-20.0). Among all patients enrolled, 146 had silent myocardial ischemia (Table:1).

When we cross tabulated parameters duration of diabetes with silent myocardial ischemia among enrolled diabetic patients, results came out to be significant with p value $\leq$ 0.05 (Table-2). Among 139 patients screened for myocardial ischemia with history of diabetes for more than 10 years showed that 57.6% (80) patients had ischemia. Remaining 186 patients who had history of diabetes for less than 10 years showed that 35.5% (66) patients had silent MI. There is a vast difference in outcome among two groups.

Table-1: Results of Demographic Parameters among enrolled patients(n=325)

Gender	**Frequency**	**%age**
Male	196	60.31%
Female	129	39.69%
Duration Of Diabetes		
Less than10 years	186	57%
More than 10 years	139	43%
Myocardial Ischemia (silent)		
Yes	146	44.9
No	179	55.1

Table-2: Cross tabulation of gender and age with myocardial ischemia

Variables	**Silent Myocardial Ischemia**				
	NO		**YES**		**p-value**
Duration Of Diabetes	**Frequency**	**Percentage**	**Frequency**	**Percentage**	
Less than10 years (186)	120	64.5%	66	35.5%	
More than 10 years (139)	59	42.3%	80	57.6%	0.001*

*statistically significant

DISCUSSION

There is increased incidence of premature deaths from MI among diabetics. Silent MI in asymptomatic diabetics has been a problem for mankind since centuries and has affected many lives over years causing myocardial infarction in 20-50% of cases among asymptomatic diabetics[5]. Studies have shown a strong association between silent myocardial ischemia and type 2 diabetes with adverse outcomes. In one previous study by Faerman et al. demonstrated that there is evidence of damage to the afferent autonomic nerves supply of the heart causing MI[9]. Changes in life styles along-with adverse effects of diabetes has raised MI incidence in our population.

In our study sample size was 325. They were divided into two groups depending on duration of diabetes. We enrolled only diabetic patients in current study. Paradoxically, in one study there were 247 patients including both diabetics (29) and non diabetics (218)[10].

In our study, two groups were made. Their association with silent (painless MI) was done. Our results showed that incidence of silent MI was high among group of patients having duration of diabetes above 10 years. Our results were in line with previous studies that showed painless MI was linked with a longer duration of diabetes (12.4 ± 9.3) among enrolled patients.

Both genders having diabetes presented with silent myocardial ischemia in present study. Out of 129 female patients, 61 (47.4%) had silent MI whereas 85(43.4%) males had silent MI. It means that both genders are at equal risk of developing myocardial ischemia with diabetes. Paradoxically, association of silent MI was seen only in male patients in many previous studies[11].

CONCLUSION

We concluded that risk of cardiovascular event (silent MI) increases with increase in duration (years) of diabetesso cardiovascular workup must be a routine among diabetics.

Limitations: It included lack of parameters like diabetic control check, lipid profile of patients enrolled and financial constrains with lack of resources.

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