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ORIGINAL ARTICLE

FREQUENCY OF SILENT ISCHEMIC HEART DISEASE IN TYPE 2 DIABETIC PATIENTS

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ABSTRACT

Objectives: To determine the frequency of silent myocardial ischemia (SMI) in type 2 diabetic patients. **Material and Methods:** This study was conducted in the Department of Cardiology, TMSS Medical College & RCH, Bogra from May 2012 to November 2012. A total of 100 patients who had type 2 diabetes mellitus (DM) for 5 years or more, were included in the study. All patients with type 1 DM, symptomatic ischemic heart disease, previous myocardial or valvular heart disease were excluded from the study. Full blood count and fasting plasma glucose were performed in all patients. The main tools for the diagnosis were electrocardiogram, exercise tolerance test (ETT) and echocardiography. Patients having normal electrocardiogram and exercise tolerance test were labeled as having no silent ischemic heart disease. Those patients who turned out to have silent ischemic heart disease were subjected to echocardiography. **Results:** Out of 100 patients, 50 were male and 50 female. Forty-four (44%) out of 100, had silent myocardial ischemia. Among these 44 patients, 25 were male and 19 female (1.3:1). The majority of patients were in the age group of 50-59. **Conclusion:** All patients with type 2 diabetes of more than 5 years duration should be screened with ETT for silent myocardial ischemia.

Key words: Silent ischemic heart disease, type 2 diabetes mellitus, silent myocardial ischemia.

INTRODUCTION

Coronary artery disease (CAD) accounts for 80 per cent of mortality in type 2 Diabetics.¹ Previously, diabetic nephropathy was the commonest cause of death in diabetics but with the availability of renal replacement therapy, ischemic heart disease (IHD) has emerged as the leading cause of death in these patients.² According to estimates CAD mortality will double from 1990 to 2020 and approximately 82 percent increase will occur in the developing world.³ Despite having age related problems elderly male patients with diabetes mellitus have a more favorable risk factor control than corresponding female patients.⁴

Silent ischemia is ischemia in the absence of symptoms or episodes of ST elevation or depression occurring without chest pain.

Diabetes mellitus, high cholesterol and positive family history of IHD are independently associated with CAD. In a study in African Brazilians, the 273 allele (-374T>A polymorphism) in the race gene is related to the susceptibility of type 2 diabetics to IHD.⁵ Nerve growth factor reduction is an important cause of silent IHD in diabetics.⁶ A large proportion of type 2 diabetics are with IHD asymptomatic.⁷ In Dhaka, 26.9 % individuals with type 2 Diabetes had IHD⁸ and every second diabetic has been found to have silent myocardial ischemia (SMI)⁹. There is higher mortality in patients with myocardial infarction and diabetes as compared to patients having myocardial infarction alone,¹⁰ and 12 leads ECG and ETT are useful for diagnosis of SMI in diabetics.¹¹ Aim of this study was to determine the frequency of SMI in type 2 diabetic patients.

OBJECTIVES

To see the association of silent ischemic heart disease and type 2 diabetes.

MATERIAL AND METHODS

This descriptive, cross sectional study was conducted in Department of Cardiology, TMSS Medical College & RCH, Bogra. Study subjects were 100 type 2 diabetic patients, selected both from out patients and in patient departments during a period from May 2012 to November 2012. All consenting patients above age 40 years with type 2 DM of 5 years duration or more were enrolled. Those with type 1 DM and type 2 diabetic patients with symptomatic heart disease were excluded from the study. After informed consent, detailed history and physical examination were done with all having a resting 12 leads ECG and ETT. Those patients who had normal ECG and ETT were labeled negative for SMI, while those patients who had ischemic changes on resting ECG and whose ETT was positive for ischemia were labeled as having SMI. In all those patients who were ETT positive, echocardiography was performed to look for regional wall motion abnormalities. The data were analyzed using SPSS version-16.

As ETT facilities are not available in TMSS Medical College and Rafatullah Community Hospital, the test was done at Popular Diagnostic center, Bogra.

RESULTS

Among our 100 Type2 diabetic subjects, 50 were male and 50 female. Their mean age was 57 years.

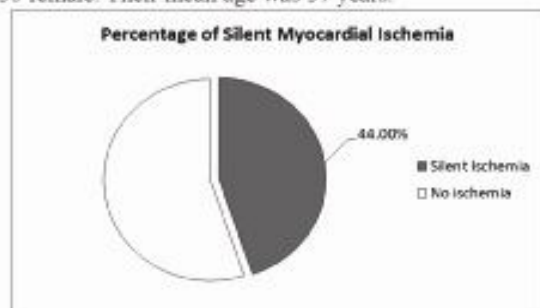


Fig 1: The pie chart shows percentage of diabetic patients who developed SMI.

Figure 1 shows that out of 100 Type2 diabetic patients 44 (44%) had SMI. Among the 44 patients with SMI, 25 (57%) were male and 19 (43%) were female.

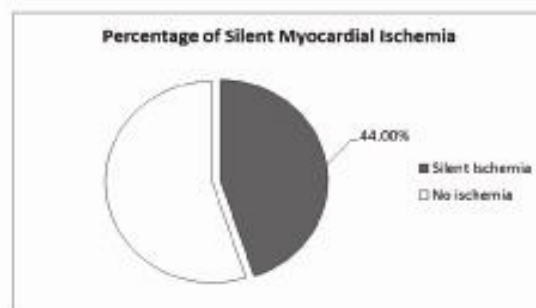


Fig 2. Relationship of ETT and Echo finding.

Echocardiography showed regional wall motion abnormalities in 10 (23 %) patients (Fig. 2). Among those who were ETT positive for SMI, 33 (75 %) was hypertensive.

Table 1: Percentage of SMI in different age groups.

Sl No.	Age Group	Total No.	ETT Positive for SMI	Percentage of SMI
1	40-49	22	4	18.2 %
2	50-59	30	12	40.0%
3	60-69	37	15	55.5%
4	70 & Above	21	13	62.0%

Percentage of SMI in different age groups is shown in Table 1. The frequency of SMI increased with the duration of diabetes.

DISCUSSION

The frequency of SMI in type 2 diabetic patients in our study was 44 %. According to different studies conducted nationally and internationally, the prevalence of silent ischemic heart disease in type 2 diabetic patients varies from 12% to almost 57%.^{12,13} Variations in frequency may be due to difference in population groups studied and the

difference in age of patients and duration of diabetes. A study showed that 52% of diabetic patients had positive ETT and found that SMI to be six fold higher in asymptomatic diabetics than in non diabetic population.

In Dhaka, 26.9 % individuals with type 2 Diabetes had IHD⁸ and every second diabetic has been found to have silent myocardial ischemia (SMI).⁹ In our study, frequency of SMI in patients increased with increasing duration of DM. Similar trend was observed in an earlier study.¹⁴ In our study, frequency of SMI was higher in males than females. 65 % of the patients in our study were hypertensive. The frequency was even higher (75%) in patients with ETT positive for SMI. The importance of hypertension leading to other complications of diabetes including cardiovascular disease comes from the United Kingdom Prospective Diabetes Study (UKPDS).¹⁵

In our study, only 12 patients had ischemic changes on resting ECG, and ETT was positive in 44%. This discrepancy between resting ECG and ETT was also reported in an earlier study which revealed that 58.3 % of the patients had abnormal ETT inspite of normal baseline ECG.¹⁶ Holter monitoring is better and more sensitive than resting ECG in detecting SMI. In addition, it can also detect arrhythmias occurring during 24 hours while the patients are engaged in routine daily activities outside the hospital.¹⁷ Echocardiography showed that only 10 (22%) patients had regional wall motion abnormality suggesting its low sensitivity for detecting SMI. In patients who are unable to exercise, dobutamine stress echocardiography can be used which is more sensitive.¹⁸

CONCLUSION

All patients with longstanding type 2 DM should be screened for Silent MI. Resting ECG and Echocardiography not being sensitive tests, ETT is more appropriate initial test for detecting SMI.

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