MEDICAL CHANNEL

Original Article

SILENT MYOCARDIAL INFARCTION IN DIABETIC AND NON DIABETIC PATIENTS

* Khalid Iqbal Bhatti ** Muhammad Ismail *** Muhammad Nawaz Lashari **** Khalida Soomro

Department of Cardiology, Civil Hospital, Karachi.

ABSTRACT

Objectives: To determine the frequency of silent myocardial infarction in Diabetic and non diabetic patients.
Study Design: Cross-sectional analytical study.
Place and Duration of Study: Civil Hospital, Karachi, Cardiology Department from February 2012 till August 2012
Metheds: This cross sectional study conducted at cardiology department of Civil Hospital Karachi from February 2012 till August 2012, comprising 80 patients who underwent ETT. After taking written consent diabetic and non diabetic patients of either sex between the age more then 30 and less then 70 years.
Results: Patients were divided into two groups diabetic and non diabetics, diabetic comprises of 50 patients and non diabetic 30 patients.The frequency of silent myocardial infarction in diabetic patients was 50% (n=25), with 95% confidence interval of (36.3%-63.6%). In non diabetic silent myocardial infarction was 8% (n=4) with 95% confident interval of (2.5 -+ 18.1). The difference n proportion of silent myocardial infarction among two groups was statically significant with p = 0.001, chi-square=10.91.
Conclusion: Silent mycordial infarction is more frequent in diabetic patients.

Keywords: Silent Myocardial Infarction, ETT, Diabetics, Non diabetics

INTRODUCTION

Patients with diabetes mellitus are at increased risk for CAD; silent ischemia is reported to be frequent in diabetic populations. The aim of the present study was to evaluate the prevalence of silent ischemia in diabetic and nondiabetic patients with assessed CAD.[1]Chest pain is certainly the predominant symptom of ischemic heart disease and the one most commonly used to establish the type and the efficacy of treatment. However, several studies suggest that many individuals with severe coronary artery lesions do not have angina pectoris. In these patients, episodes of transitory myocardial ischemia may be "silent," although abnormal asymptomatic ST changes may be recorded during AECG monitoring.[2,3,4] Evidence suggests that individuals having co-morbidity with type 2 diabetes present in association with other coronary risk factors and are more likely to have silent myocardial ischaemia.[5]The silent ischemic events considerably outnumber the

Correspondence to:
DR. KHALID IQBAL BHATTI
House No. 8-K, Block-6, PECHS, Karachi.
E-mail: khalidsaindad@yahoo.com
Cell : 0300-2292564

symptomatic ones,[5,6] and it is generally accepted that nearly 75% of the transient ischemic episodes recorded during AECG monitoring are asymptomatic in patients with stable angina pectoris.[3,5,6] 17Numerous studies have demonstrated that the presence of silent ischemia during exercise testing or AECG monitoring predicts adverse clinical outcome and poor survival.18Evidence accumulated in recent years demonstrated that asymptomatic myocardial infarction or asymptomatic myocardial ischemia occurs more frequently in diabetic patients.[7]In fact, the Framingham study reported that in diabetic patients, the incidence of painless myocardial infarction was higher than that in nondiabetic patients.[8,9,10] Other studies also demonstrated that in diabetic patients, the incidence of painless myocardial infarction is higher than in nondiabetic patients.[11] The clinical significance of silent myocardial ischaemia is similar to that of symptomatic cardiac ischaemia. Prospective studies have shown that patients with silent myocardial ischaemia have an increased risk of acute coronary events.[12,13]

METHODOLOGY

This is a cross sectional study conducted at cardiology department of Civil Hospital Karachi from February 2012 till August 2012, comprising 80 patients who underwent ETT. After taking written consent diabetic and non diabetic patients of either sex between the age more then 30 and less then 70 were included and patients previous MI, Pacemaker Implantation, Precious CABG, LBBB, LVH, ST depression On ECG were excluded.

Sypmtom limited ETT was carried out using Bruce protocol. Through out the exercise test ECG was continously monitored, and recorded on paper at the end of each stage, ECG was also obtained during recovery period. Blood pressure was measured at the end of each stage, ETT was continued until 85% age predicted heart rate was achieved, Test was stopped if patient complain of symptoms of chest pain, SOB or ischemic response n ECG was detected. A positive stress test was defined as horizontal or down sloping ST depression of 1mm or more wasrecorded.

Data analysis: All data obtained was developed in SPSS version 12. To compare the quantitative variables such as age, SBP/ DBP, RBS and FBS,the student t-test employed. To compare the difference in percentage in diabetic and non diabetic patients the chi-square test of proportion was used.

RESULT

Patients were divided into two groups diabetic and non diabetics, diabetic comprises of 50 patients and non diabetic 30 patients.

TABLE 1
FREQUENCY OF SMI IN DIABETIC AND NON DIABETICS

Groups	Silent ischemia yes	Silent ischemia No	Tital
Diabetic	25 (50%)	25 (50%)	50
Non diabetic	4 (13.3%)	26 (87.7%)	30
Total	29 (36.2%)	51 (63.7%)	80

P= 0.001, chi square = 10.91

TABLE 2
FREQUENCY OF SMI ACCORDING TO SEX

	Diabetic	Nin diabetic	Total
Male	18(72%)	3(75%)	21
Female	7(28%)	1(25%)	8
Total	25	4	29

TABLE 3
PRESENCE OF RISK FACTORS

Groups	Diabetic	Non diabetic	Total	P value	Chi-square
Hypertension	31 (62%)	11 (36.6%)	42 (52.2%)	0.02	4.83
Dyslipidemia	10 (20%)	4 (13.3%)	14 (17.5%)	0.44	0.58
smoking	11 (22%)	13 (43.3%)	24 (30%)	0.04	4.06

The frequency of silent myocardial infarction in diabetic patients was 50% (n=25), with 95% confidence interval of (36.3%-63.6%). In non diabetic silent myocardial infarction was 8% (n=4) with 95% confident interval of (2.5 -$^{+}$ 18.1). The difference n proportion of silent myocardial infarction among two groups was statically significant with p = 0.001, chi-square=10.91.

The occurance of silent myocardial infarction was found independent of gender when tested by chi-square test with p = 0.63, chi-square = 0.23. The mean age of silent myocardial infarction among male was 52.38-$^{+}$ 9.02 yrs, and in female it was 48.65-$^{+}$8.87yrs. The difference of age in SMI were not statically significant(p=0.07, t=1.07).

Among risk factors hypertension was more 62% in diabetic and 36.6% in non diabetic, with p = 0.02 and t = 4.83.

Dyslipidemia was found in 20% in in diabetic and 17.5% in non diabetic, with p = 0.44 and t = 0.58.

Smoking was 22% in diabetic and 43.3 % in non diabetic, with p = 0.04 and t = 4.06.

There were 35 males and 15 females in diabetic group and 23 male and 7 female in non diabetics. The over all male were 58 (72.5%) and female were 22(27.5%).

DISCUSSION

Studies in west carried out on pakistani, bangladeshi and indian patients showed that prevelance of CAD is high among them.out of these patients the disease does not manifest and they are diagnosed on the basis of some diagnostic test such as ETT.[14] In our study the incidence of SMI was more in diabetics .Patients with diabetes have high risk if CAD and MI. It had been generally believed that when MI occurs in diabetic it is not accompanied by classical angina.[15] This lower frequency of symptoms among diabetis had been attributed to occurance of diabetic neuropathy,which may damage the sensory nervous system to heart and hence interefere with the transmission of pain. Foramen et al found evidence of typical diabetic neuropathic cahnges involving the afferent nervous system and parasympathetic tract in patients dying with MI without symptoms.[16] Patients with DM and CAD are thought to have high frequency of painless MI.[17] Rashed SZ showed in his study that more silent MI in diabetic patient 72% as compare to non diabetics 47% with p=0.001. [18]Nesto et al in his study concluded that MI is often asymtomatic in patients with diabetes.[19] There are two studies Smith et al found there was no difference in prevelance of SMI between diabetics and non diabetics undergoing ETT soon after MI,[20] another study by Chip Kin et al also showed there was no difference in prevelance of SMI betweendiabetic and non diabetics(54% vs 46%) .[21]

CONCLUSION

Silent mycordial infarction is more frequent in diabetic patients.

REFRENCES

1- Falcone C, Nespoli L, Geroldi D, Gazzaruso C, Buzzi MP, Auguadro C. Silent myocardial ischemia in diabetic and nondiabetic patients with coronary artery disease. Int J Cardiol. 2003 Aug;90(2-3):219-27.

2- Stern S, Tzivoni D. Early detection of silent ischaemic heart disease by 24-hour electrocardiographic monitoring of active subjects. Br Heart J. 1974;36:481-486.

3- Schang SJ, Pepine CJ. Transient asymptomatic ST segment depression during daily activity. Am J Cardiol. 1977;39:396-402.

4- Zellweger Mj, Hachamovitch R, Kang X, Hayes Sw, Friedman Jd, Germano G, Et Al. Threshold, incidence, and predictors of prognostically high-risk silent ischaemia in asymptomatic patients without prior diagnosis of coronary artery disease. J Nucl Cardiol 2009; 16: 193-200.

5- Deluca Aj, Kaplan S, Aronow Ws, Sandhu R, Butt A, Akoybyan A, Et Al. Comparison Of Prevalence Of Unrecognized Myocardial Infarction And Of Silent Myocardial Ischaemia Detected By A Treadmill Exercise Sestamibi Stress Test In Patients With Versus Without Diabetes Mellitus. Am J Cardiol 2006; 98: 1045-6

6- Chierchia S, Brunelli C, Simonetti I, Lazzari M, Maseri A. Sequence of events in angina at rest: primary reduction in coronary blood flow. Circulation. 1980;61:759-764.

7- Deanfield JE, Shea M, Ribiero P, de Landsheere CM, Wilson RA, Horlock P, Selwyn AP. Transient ST-segment depression as a marker of myocardial ischemia during daily life. Am J Cardiol. 1984;54:1195-1200.

8- Weiner DA, Ryan TJ, McCabe CH, Luk S, Chaitman BR, Sheffield T, Tristani F, Fisher L. Significance of silent myocardial ischemia during exercise testing in patients with coronary artery disease. Am J Cardiol. 1987;59:725-729.

9- Baxter Cg, Boon Na, Walker Jd. Detection Of Silent Myocardial Ischaemia In Asymptomatic Diabetic Subjects: The Diad Study. Diabetes Care 2005; 28: 756-7.

10- Miller Td, Redberg Rf, Wackers Fj. Screening Asymptomatic Diabetic Patients For Coronary Artery Disease: Why Not? J Am Coll Cardiol 2006; 48: 761-4.

11- Deluca Aj, Saulle Ln, Aronow Ws, Ravipati G, Weiss Mb. Prevalence of silent myocardial ischaemia in persons with diabetes mellitus or impaired glucose tolerance and association of heamoglobin A1c with prevalence of silent myocardial ischaemia. Am J Cardiol 2005; 95: 1472-4.

12- Turrini F, Messora R, Giovanardi P, Tondi S, Magnavacchi P, Cavani R, Et Al. Screening asymptomatic patients with diabetes for unknown coronary artery disease: does it reduce risk? An open-label randomized trial comparing a strategy based on exercise testing aimed at revascularization with management based on pharmacological/ behavioural treatment of traditional risk factors. Daddy-d trial (Does coronary atherosclerosis deserve to be diagnosed and treated early in diabetics?). Trials 2009; 10: 119.

13- Sukhija R, Dhanwal D, Gambhir Ds, Dewan R. Silent myocardial ischaemia in patients with type ii diabetes mellitus and its relation with autonomic dysfunction. Indian Heart J 2000; 52: 540-6.

14- Topol E, Cliff R, Prystowsky E et al. Topol text book of cardiovascular medicines. Third edition,553-561,Lippincott Williams and Wilkins, Philadelphia 2007.

15- Shoback, edited by David G. Gardner, Dolores. Greenspan's basic & clinical endocrinology (9th ed.). New York: McGraw-Hill Medical. pp. Chapter 17 2011.

16- Hoeldtke RD, Bryner KD, McNeill DR, Hobbs GR, Riggs JE, Warehime

SS, Christie I, Ganser G, Van Dyke K: Nitrosative stress, uric acid, and peripheral nerve function in early type 1 diabetes. Diabetes 51:2817–2825, 2002

17- S W Davies. Clinical presentation and diagnosis of coronary artery disease: stable angina. Br Med Bull 2001. 59 (1): 17-27.

18- Screening for Type 2 Diabetes Mellitus: Update of 2003 Systematic Evidence Review for the U. S. Preventive Services Task Force. AHRQ Publication No. 08-05116-EF-1 2008.

19- Holland Interuniversity Nifedipine-Metoprolol Trial (HINT) Research Group . Early treatment of unstable angina in the coronary care unit: a randomised, double blind, placebo controlled comparison of recurrent ischaemia in patients treated with nifedipine or metoprolol or both. Br Heart J 1986; 56: 400-413.

20- Murthy VL .Enhanced Risk Stratification With Noninvasive Measurement of Coronary Flow Reserve Using Positron Emission Tomography Circulation. 2012;126:1808-1811

21- Silent myocardial ischemia in diabetic and nondiabetic patients with coronary artery disease. doi:10.1016/S0167-5273(02)00558-2