Study of Silent Myocardial Infarction in Type Two Diabetes Mellitus Patients in a Tertiary Care Center

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ABSTRACT

BACKGROUND

Coronary artery disease is known as a serious plague because of its regularity in different bits of the world. The signs of coronary artery issue handle a wide range from the mind boggling minor coronary atherosclerosis without angina or ischaemia to sudden passing

METHODS

The present study was cross sectional, observational study carried out at tertiary care center. This study was conducted during the period from January 2016 to June 2017. All Type two Diabetes Mellitus 100 patients attending Department of Medicine included in the study.

RESULTS

Majority of study subjects were in age 51 - 60 years (46 %) having DM (Diabetes Mellitus) since 5 - 10 years (46 %). A lot of patients overweight (40 %), dyslipidaemia (22 %). It mean fasting and post prandial glucose among patients was 164 ± 15.18 mg / dL and 189.4 ± 23.29 mg / dL exclusively. The mean LDL, HDL, VLDL, complete cholesterol and greasy oils levels among patients was 118.14 ± 24.2 mg / dL, 42.60 ± 5.12 mg / dL, 35.68 ± 7.09 mg / dL, 204.96 ± 28.76 mg / dL, 166.17 ± 31.92 mg / dL independently. The regularity was 27 %. The prevalence of MI among DM patients was major in age pack 51 - 60 years (13 %). The ECG changes in calm MI among DM patients showed that a lot of calm MI patients had ST dejection and adjusted T wave inversion (77.77).

CONCLUSIONS

Standard checking ECG is be commonly useful and unobtrusive gadget in myocardial ischaemia area n asymptomatic diabetic patients

KEY WORDS

Myocardial Ischaemia, Diabetes Mellitus.

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BACKGROUND

Coronary artery disease has become a major health problem throughout the world. The signs of coronary artery vary from being a minor coronary atherosclerosis without angina or ischaemia to sudden passing. Investigates all through the past very few decades provoked the possibility of evasion, clinical organization and cautious myocardial revascularization and besides to the regard for asymptomatic coronary passageway sickness and calm myocardial ischaemia.¹

Silent myocardial ischaemia is described as angina. In study, 30 % of myocardial infarcts hushed up, examined unmistakably by consecutive electrocardiography.^{2,3} Cardiovascular diseases and particularly coronary issue are the fundamental wellsprings of death with type-2 diabetes.^{4,5} CHD (Coronary Heart Disease) is dependably asymptomatic in these patients, and is thusly at a pushed stage when it ends up being clinically appear.^{6,7} Consequently, most standards propose a deliberate screening by pressure testing of asymptomatic high risk patients with diabetes.^{8,9}

The prevalence of diabetes mellitus is truly broadening. More than 170 million patients have DM wherever all through the world, and the World Health Organization (WHO) guess broadens double a similar number of patients in 2025 DM is a huge cardiovascular risk factor, and it habitually prompts genuine cardiovascular challenges (periphery artery sickness, myocardial confined rot, stroke). Coronary course disease is the basic driver of death with DM and records for over 75 % of deaths. Silent myocardial ischaemia is progressively increasing in diabetic patients inciting a conceded finding and a further evolved period of the CAD (Coronary Artery Disease) at the hour of the end.^[10] Diabetic patients intertwine a particularly high-danger pack for coming about cardiovascular events, with a partiality for calm myocardial ischaemia.¹¹ In one appraisal, 12 % of diabetic patients had calm ischaemia, while 19 % of relative patients had beguiling ischaemia.¹² Truth be told, there is creating assertion that asymptomatic myocardial regions of kept degradation and calm ischaemia happen fundamentally more occasionally in diabetic patients.¹³ The parts for diminished angina in this get-together of patients harden moving torment limit affectability, autonomic neuropathy, and mental factors.¹⁴ For any circumstance, whether or not the region of calm ischaemia recorded during a tiny bit at a time life fuses a self-supervising hazard factor for mortality remains cloud. The deterrent for screening diabetic patients depends essentially on whether the isolating affirmation of coronary easily course contamination would recognize therapeutic approaches that would reduce heart wretchedness and mortality. Clinical conditions that may warrant screening in asymptomatic patients consolidate preoperative open entryway for major no cardiac or vascular surgery,¹⁵ screening before renal transplantation,¹⁶ and evaluation before starting a staggering movement program.¹⁷ The most recent guidelines released by American Heart Association favour non-invasive testing inside seeing a high-chance cautious action, or a transitional risk action joined with poor utilitarian cut off regarding moreover chance depiction before clinical method, even without symptoms.¹⁸ The headway in area and treatment of CAD grants us to reconsider the screening of SMI (Silent Myocardial Ischaemia), with the craving for an early CAD assurance, which will provoke a dynamically fruitful treatment and the decrease

of cardiovascular disarrays and mortality. Hence, the present study conducted to study silent myocardial ischaemia / infarction in type 2 diabetes mellitus patients.

METHODS

After obtaining Institutional Ethical Committee clearance, this cross-sectional study was conducted over a period of two years at a tertiary care centre. 100 type 2 diabetes mellitus patients were selected by simple random sampling technique.

Sample Size Estimation

The power of silent MI in DM was taken as 30 %. Sample size was evaluated at 5 % level of importance with an acceptable error of 10 % and a model size of 100 cases.

Inclusion Criteria

Patients with type 2 diabetes mellitus with > 1-year range who do not have any cardiovascular related symptoms and above the age of 18 years.

Data Collection

Cases were selected from the Department of Medicine [OPD (Out Patient Department) and IPD (In Patient Department)], Krishna Institute of Medical Sciences, Karad. Informed consent was obtained from all the patients they were assessed with separate history, clinical evaluation and relevant assessments including resting ECG. Each subject was allowed to rest in prostrate position for 15 minutes before ECG recording is done. Following the standard procedure, 12 lead ECG was recorded and evaluated. BMI was calculated for all the patients. BMI classification by National Heart, Lung and Blood Institute, U.S. Department of Health & Human Services was used¹⁰. After period of rest, pulse rate and blood pressure were measured.

Investigations Done

1. FBSL / PPBSL / HbA1C
2. Lipid Profile
3. ECG

Criteria for Diagnosis of Myocardial Ischaemia

Horizontal or down sloping ST depression of > 0.05 mv (0.5 mm) in two contiguous leads suggest myocardial ischaemia. ST Segment Depression May Take One of the Following Forms

1. Horizontality of the ST Segment.
2. Upwards sloping ST segment depression.
3. Plane ST Segment depression.
4. Downwards sloping ST Segment Depression.
5. Symmetrical T wave inversion.

Criteria for Diagnosis of Myocardial Infarction

Diagnosis of MI on ECGs is based on presence of any one of following:

- Development of new pathological Q waves

- Presence of ST segment elevation or depression
- Development of new left bundle branch block
- The changes in ECG should be present in two contiguous leads.

Statistical Analysis

Analysis were performed by using Microsoft Excel and SPSS 20.0 version software packages.

RESULTS

Age	Frequency	Percentage
Up to 30 Yrs.	01	01.00
31 yrs. - 40 Yrs.	06	06.00
41 yrs. - 50 Yrs.	27	27.00
51 yrs. - 60 Yrs.	46	46.00
> 60 Yrs.	20	20.00
Total	100	100

Table 1. Distribution of Study Subjects According to Age

The above table 1 reveals that the majority of study subjects were in age group 51 - 60 yrs. (46 %) followed by 41 - 50 yrs. (27 %)

Gender	Frequency	Percentage
Male	44	44.00
Female	56	56.00
Total	100	100

Table 2. Distribution of Study Subjects According to Sex

The above Table 2 observed that majority of study subjects were in female (56 %).

Duration of DM (years)	Frequency	Percentage
1 Years - 5 Years	34	34.00
5 Years - 10 Years	46	46.00
> 10 Years	20	20.00
Total	100	100

Table 3. Distribution of Study Subjects According to Duration of Illness

The above Table 3 observed that majority of study subjects were having DM since 5 - 10 years (46 %). The study subjects with DM > 10 years were 20 %.

BMI	Frequency	Percentage
Normal	38	38.00
Overweight	40	62.00
Obesity (Class I)	22	22.00
Total	100	100

Table 4. Distribution of Study Subjects According to BMI

The above table 4 observed that majority of study subjects were overweight (40 %).

Spread of patients - scattering of DM patients according to risk factors. It was seen that a lot of patients were having dyslipidaemia (22 %). Distribution of patients according to recognitions at presentation.

The mean fasting and post prandial glucose among patients was 164 ± 15.18 mg / dL and 189.4 ± 23.29 mg / dL independently.

The mean LDL, HDL, VLDL, hard and fast cholesterol and greasy substances levels among patients was 118.14 ± 24.2 mg / dL, 42.60 ± 5.12 mg / dL, 35.68 ± 7.09 mg / dL, 204.96 ± 28.76 mg / dL, 166.17 ± 31.92 mg / dL independently.

Assignment according to ordinariness of calm MI among patients: power of calm MI among DM patients. It was seen that transcendence of calm MI among patients with DM was 27 %.

Catering as shown by age inescapability of calm MI among patients: It was seen that normality of calm MI among DM patients was major in age bundle 51 - 60 years (13 %) followed by age pack > 60 years (8 %). power of calm MI among DM patients by sexual direction. It was seen that regularity of calm MI among DM patients among male patients was 12 % and female was 15 %.

ECG changes in calm MI among DM patients. It was seen that prevailing piece of calm MI patients had ST pity with even T wave inversion (77.77 %) The fresh start left gathering branch block (LBBB) was seen in 11.11 % patients. ECG changes suggestive of ST rise were not found.

DISCUSSION

The flow cross sectional examination was driven in the region of Western Maharashtra, Satara District to understand the ECG changes present in patients of Type 2 diabetes mellitus. In the momentum assessment, it was seen that bigger portion of patients were in 51 - 60 years age (46 %) trailed by 41 - 50 years (27%). In an assessment done by Sahil Gupta et al¹⁹ on assessment of ECG characteristics in patients with asymptomatic type 2 diabetes mellitus watched mean period of asymptomatic diabetic patients was 50.3 ± 11.90 years (age broaden 25 - 75 years). These abnormalities are more found in age 35 - 44 and 45 - 54 years. In the current assessment, it was seen that a lot of patients were female (56 %) and men were 44 %. It was seen that predominant some portion of patients were having DM since 5 - 10 years (46 %). The patients with DM > 10 years were 20 %. In an examination done by Sahil Gupta et al¹⁹ on evaluation of ECG varieties from the standard in patients with asymptomatic Type 2 diabetes mellitus viewed the asymptomatic T2DM cases with ECG changes had long haul of length of diabetes mellitus.

It was seen that a lot of patients were overweight (40 %) followed by weight Class I (22 %). The larger some portion of patients were having dyslipidaemia (22 %). It was seen that mean fasting and post prandial glucose among patients was 164 ± 15.18 mg / dL and 189.4 ± 23.29 mg / dL independently. It was seen that mean LDL, HDL, VLDL, full scale cholesterol and greasy substances levels among patients was 118.14 ± 24.2 mg / dL, 42.60 ± 5.12 mg / dL, 35.68 ± 7.09 mg / dL, 204.96 ± 28.76 mg / dL, 166.17 ± 31.92 mg / dL exclusively. In an examination done by Sahil Gupta et al¹⁹ on evaluation of ECG inconsistencies in patients with asymptomatic Type 2 diabetes mellitus saw that mean fasting glucose among patients was 205 ± 91 mg / dL, mean HDL levels 39.66 ± 10.17 mg / dL.

In the current examination, it was seen that the inescapability of calm MI among patients with DM was 27 %. In an assessment done by Sahil Gupta et al¹⁹ on appraisal of ECG varieties from the standard in patients with asymptomatic Type 2 diabetes mellitus viewed 26 % asymptomatic diabetics had ECG abnormalities. Motoji Naka et al²⁰ isolated diabetic patients and non-diabetic control subjects with respect to the regularity of calm myocardial ischaemia saw 31 % astonishing nature of calm myocardial ischaemia diabetic patients. V. I. Koshlia et al²¹ in an evaluation on calm myocardial ischaemia

in patients with diabetes mellitus type 2 watched power of calm myocardial ischaemia in patients with diabetes is by a wide margin higher (2 - 7 times) than in those without diabetes.

It was seen that power of calm MI among DM patients was major in age pack 51 - 60 years (13 %) followed by age bundle > 60 years (8 %). In an assessment done by Sahil Gupta et al¹⁹ on appraisal of ECG varieties from the standard in patients with asymptomatic type 2 diabetes mellitus watched mean time of asymptomatic diabetic patients with ECG oddities 51 ± 10.05 years. Motoji Naka et al²⁰ differentiated diabetic patients and non-diabetic control subjects with respect to the normality of calm myocardial ischaemia watched mean season of patients with calm MI was 62 years.

It was seen that prevalence of calm MI among DM patients among male patients was 12 % and female was 15 %. In an examination done by Sahil Gupta et al¹⁹ on evaluation of ECG abnormalities in patients with asymptomatic Type two Diabetes Mellitus watched female quality (53.84 %). Motoji Naka et al²⁰ isolated diabetic patients and non-diabetic control subjects with respect to the commonness of calm myocardial ischaemia watched female quality (38 %) in calm myocardial ischaemia diabetic patients.

The ECG changes in calm MI among DM patients showed that bigger piece of calm MI patients had ST hopelessness and adjusted T wave inversion (77.77 %) fresh start left pack branch block (LBBB) was seen in 11.11 % patients. In an assessment done by Sahil Gupta et al¹⁹ on evaluation of ECG varieties from the standard in patients with asymptomatic Type two Diabetes Mellitus observed most normal peculiarity viewed was ST-T changes (12 %) followed by LAE (6 %), LVH (4 %), LBBB (2 %) and RBBB (2 %). In an evaluation by Sellers MB et al⁹⁵ on African Americans, the collections and consistency of ECG peculiarities saw were according to the going with: surrendered QTc (25.5 %), T wave changes (22 %), LVH (18.5 %), sinus tachycardia (15.5 %), Ischaemic Heart Disease (IHD) (9 %), conduction deserts (7 %) and ectopic impacts (4 %). ECG groupings from the standard among coherently settled diabetics were high and included conceded QTc, LVH, IHD and conduction scorns.

In other near evaluations the certainty of ECG quirks in diabetics separated from 24.9 % - 44.3 % depending on the friend considered.^{22,23} An examination on 221 patients from Spain demonstrated that ECG eccentricities were found in 24.9 % close to the beginning and 44.3 % were found around the fulfillment of the appraisal with typical term of follow up of 5.9 years. The current evaluation is cross sectional where 27 % asymptomatic diabetics had ECG idiosyncrasies. In the longitudinal evaluation from Spain, the closeness of ECG irregularities could predict the occasion of future cardiovascular event in patients with T2DM more definitely than some other threat factor alone.²⁴ The requirement of the assessment was little model size of the addressing people, follow up was not examined.

Diabetes mellitus has been known for quite a while to be connected with poor cardiovascular figure. On account of the delicate neuropathy, the coronary conductor suffering in diabetic patients is an unbelievable part of the time asymptomatic. Likewise twelve leads resting ECG can be inside standard cut off amasses even in a pushed season of coronary aratry pain. From this time forward despite the standard ECG other electrocardiographic procedures began to be secured

request to locate some essential indications of myocardial harms accomplished by DM.

CONCLUSIONS

Diabetes mellitus has been known for quite a while to be connected with poor cardiovascular prognosis. Diabetes mellitus causes both microvascular and macrovascular burdens. Due to delicate neuropathy, coronary artery disease in diabetic patients is in many cases asymptomatic. In such cases, ECG can be used as an unobtrusive instrument to determine the area affected in myocardial ischaemia in asymptomatic diabetic patients.

Data sharing statement provided by the authors is available with the full text of this article at jemds.com.

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