Coronary Heart Disease Risk Factors Among Diabetic Patients Attending A Tertiary Care Hospital – A Cross Sectional Study

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Citation

Abstract

Introduction: The public health impact of cardiovascular disease in patients with diabetes is already enormous and is increasing.
Objectives: 1. To study the prevalence of risk factors of Coronary Heart Diseases among patients with Diabetes Mellitus. 2. To assess the awareness about risk factors of Coronary Heart Diseases in those patients.

Materials and Methods: A Hospital based cross sectional study was conducted in IMS & SUM Hospital in a period of 2 months. A convenient sample of 200 diagnosed diabetic patients were included. Data collected with predesigned and pretested questionnaire after taking consent.
Results: Out of 200 participants, 60% of patients had fasting blood sugar more than or equal to 126mg%. 21.5% diabetics have overweight or obesity when assessed as per BMI, but 89.5% were having central obesity, 41% were having history of hypertension and 8.5% had history of cardiovascular disease.
Regarding lifestyle related factors, 92.5% diabetics were doing sedentary work, 68% were not taking or occasionally taking fruits, 58.5% were not practicing any fitness activities and 21.5% were currently using tobacco. Out of 64 patients, from whom lipid profile report collected, about 50% of them were having dyslipidemia. In the present study, 68.5% diabetics don't know that diabetes increases the risk of CHD and 55 % don't know that regular exercise protects from CHD.
Conclusion: A large proportion of patients were having uncontrolled blood sugar despite of taking medicines or insulin which is a great concern. Intervention in the form of lifestyle modification may be helpful.

INTRODUCTION

Diabetes mellitus is a global epidemic in the new millennium. The World Health Organization (WHO) has observed an apparent epidemic of diabetes that is strongly related to lifestyle and economic change to exceed 200 million over the next decade; mostly with type 2 diabetes mellitus, and all are at risk of the development of complications.1 It is estimated that in the year 2000, 171 million people had diabetes worldwide and it is expected to double by the year 2030 AD.2 Diabetes and its complications pose a major threat to public health resources and World Health Organization (WHO) has projected the maximum increase in Diabetes would occur in India.3 Cardiovascular complications are now the leading causes of diabetes-related morbidity and mortality. Coronary heart disease (CHD) is common in people with diabetes mellitus (DM).4 In the Multiple Risk Factor Intervention Trial, the age-adjusted incidence of CHD was four times greater in people with than in those without diabetes. Moreover, myocardial ischemia due to coronary atherosclerosis commonly occurs without symptoms in patients with diabetes.5

The most important complication of Type 2 diabetes Mellitus (DM) is coronary heart disease (CHD) which presents with increased mortality and morbidity compared to the non-diabetic population. In the Framingham Heart Study, the presence of diabetes doubled the age-adjusted risk for cardiovascular disease in men and tripled it in women.6 Patients with diabetes and without previous myocardial infarction (MI) have as high a risk of MI as persons without diabetes and with a previous MI, and that the cardiovascular risk factors of both groups should be treated equally aggressively.7

Although much new knowledge has been uncovered on the DM-CHD connection in the past decade, more research is needed which can affect significantly the morbidity and

mortality of diabetes. An attempt was made to assess the prevalence of risk factors for Coronary Heart Diseases among patients of Diabetes Mellitus attending IMS & SUM Hospital.

OBJECTIVES

1. To study the prevalence of risk factors of Coronary Heart Diseases among patients with Diabetes Mellitus.
2. To assess the awareness about risk factors of Coronary Heart Diseases in those patients.

MATERIALS AND METHODS:

As per OPD registers of Endocrinology and Medicine, total number of diabetic patients in the month of December 2012 were 632. Considering the huge attendance of diabetic patients, it is proposed to see the risk factors of coronary heart diseases among those patients.

A Hospital based cross sectional study was conducted in Institute of Medical Sciences & SUM Hospital in a period of 2 months. The diabetic patients who attended the Endocrinology OPD and Medicine OPD during this period were included in the study. The study period was fixed for 2 months from 1.5.2012 to 30.6.2012. During this period of two months, collection of data was actually done for 1 and ½ months i.e. from 8th May to 23rd June 2012. Patients aged 20 years and above, and on treatment for diabetes for at least 3 months, were included after taking consent.

Sample size

On an average, 7-8 respondents were interviewed per day; Endocrinology OPDs are held 5 days a week. Considering the time and feasibility of the study, 200 subjects were included in the study (calculated through convenience sampling i.e. 6 weeks × 5 days × 7 -8 subjects per day = 200).

Selection Criteria:

Patients registered on the day of interview will be selected using simple random sampling method. Patients aged 20 years and above, and on treatment for diabetes for at least 3 months, were included in the study. Patients having gestational diabetes and major psychiatric disorders were excluded from the study because these are coexisting illnesses and may distort the results.

Pre-Testing: For the recording of data a schedule was prepared. At the beginning of the study, this instrument was pre-tested to test the feasibility, reliability & validity of the questions while eliciting the required information. Accordingly the questionnaire/ schedule was modified, corrected & finalized for data collection.

Data collection:

The study subjects were interviewed using a predesigned, pretested and semi structured questionnaire. The prospect of this study for improving understanding of diabetes was explained to the participants. Those patients who were reluctant and refused to participate were excluded from the study.

Collection of data was done in a friendly atmosphere after obtaining informed consent. Some time was spent, at the beginning, on informal discussions with the purpose of gaining the confidence of the study subjects.

Data in respect of age, sex, socio economic status, per capita monthly income, family size, duration of diabetes, co-morbidity, history of cardio vascular disease, family history of diabetes and cardio vascular disease, dietary habits, tobacco and alcohol use, physical activity etc. were collected. The patients of Diabetes Mellitus were asked about the detailed clinical history and treatment history. Their heights, weight, BMI, waist circumference, waist-hip ratio, blood pressure etc. were recorded. The investigations like Fasting blood sugar, Blood cholesterol, lipid profile etc. were done as a part of routine investigations prescribed by the treating physician. The study adapted the WHO STEPS approach, and the questionnaire was modified accordingly. This study was approved by Institutional Ethical Committee of Institute of Medical Sciences and SUM Hospital and accepted by ICMR under Short Term Studentship 2012.

Data processing and analysis:

The information thus collected was processed and analyzed in the dept. of Community Medicine by using SPSS software and wherever necessary through manual calculation.

RESULTS

The age of diabetic patients included in the study varied from 22-90 years. The mean age was 50.57+12.66. 58% of diabetic patients were male and 42% were female. Out of 200 study subjects, 96.5% were Hindu, 47% belong to general category, and 42.5% belong to other backward caste. In the present study, 94% were literate and 6% were illiterate. 60% had above secondary or higher education. Majorities (36%) were teacher/clerk or similar service holders followed by 32.5% were housewives, 14% were doing business. 7% of diabetics were professionals by occupation. Among diabetics, 67% belong to the upper social class. 29.5% belong to middle and 3.5% belong to low social class. In the present study, 61% of study subjects belong to nuclear families and 39% belong to joint families. Majority (88%) were married.

It was observed that only 24.5% diabetic patients were having fasting blood sugar less than 110 mg%, 15.5% had 110-135mg% and 60% of patients had fasting blood sugar more than or equal to 126mg%. Duration of diabetes was more than 5 years in 47.5% patients, 1-5 year in 35.5% patients and 3 months -1 year in 17% patients.

Table 1

Life style related factors among Diabetic patients

Factors	No. (Percentage)
Sedentary work	185 (92.5)
Unhealthy diet	135 (67.5)
Not taking or occasionally taking fruits	132 (66)
No regular walking or fitness activities	117 (58.5)
Currently using tobacco	43 (21.5)
Consuming alcohol	15 (7.5)
Exposed to passive smoking	9 (4.5)

Study of lifestyle related factors revealed that, 92.5% diabetics were doing sedentary work followed by 67.5% were taking unhealthy diet and 66% were not taking or occasionally taking fruits. It was also observed that 58.5% were not practicing regular walking or any fitness activities. Among diabetic patients, 21.5% were currently using tobacco, 7.5% consume alcohol and 4.5% were exposed to passive smoking either in work place or home.

When the study subjects were assessed for overweight and obesity as per BMI, it was found that 21.5% patients were having BMI > 25. When assessed by waist-hip ratio, it was observed that 89.5% of them were having central obesity. 92.85% of females and 87.06% of males have central obesity. Presence of central obesity was not significantly different in males and females ($X2 = 1.737$, P=0.188).

Table 2

Coronary Heart Disease risk factors among Diabetics

CHD Risk Factors	No. (Percentage)
High fasting blood sugar levels (>110 mg%)	151 (75.5)
Abdominal obesity (High Waist-hip ratio)	132 (66)
H/O Hypertension	82 (41)
High BP at the time of examination	33 (16.5)
Low HDL <45mg% (n=64)	45 (70.31)
High TG > 150mg% (n=64)	33 (51.56)
LDL > 100 mg% (n=64)	30 (46.87)
High Cholesterol level ≥ 200 mg% (n=64)	13 (20.31)

All the study subjects were assessed for coronary heart disease risk factors. It was depicted from the above table that, 75.5% diabetic patients were having fasting blood sugar value more than 110mg%, 66% of have central obesity, 41% have H/O hypertension, 16.5% were having high blood

pressure at the time of examination (> 140/90 mm of Hg). Hypertension was significantly higher in overweight or obese patients ($X2 = 9.294$, P=0.010) and patients of more than 50 years age ($X2 = 14.368$, P=0.000).

Out of 200 participants, lipid profile report could be collected from 64 patients and out of them, 70.3% had HDL <45mg% and 51.56% had TG > 150mg%, 46.87% had LDL > 100 mg% and 21.3% patients had total blood cholesterol > 200mg% which are the risk factors of the coronary heart disease.

In the present study, 8.5% have history of cardiovascular disease. When they were asked for family history, 20.5% told that they have family H/O cardiovascular disease and 35.5% told that they have family H/O diabetes.

Table 3

Knowledge about CHD Risk factors

No Knowledge about CHD Risk factors	No. (Percentage)
Worry/Anxiety	150 (75)
Diabetes Mellitus	137 (68.5)
No regular exercise	110 (55)
Overweight/ Obesity	93 (46.5)
High Cholesterol	73 (36.5)
High fat diet	72 (36)
High BP	60 (30)
Tobacco	52 (26)
Heavy alcohol consumption	52 (26)

Participants were assessed for their knowledge on risk factors of the coronary heart disease, 75% patients don' know that worry/anxiety increases the risk of CHD and 68.5% don't know that diabetes increases the risk of CHD. 55% of study subjects don't know that regular exercise protects from coronary heart disease risk and 46.5% of study subjects don't know that overweight and obesity increases the risk of CHD. It was seen that 36.5% don't know that high cholesterol increases the risk, 36% don't know that high fat diet increases the risk and 30% of them don't know that high BP increases the risk. 26% of them don't know that tobacco use and also 26% don't know that heavy alcohol consumption increases the risk of coronary heart disease.

DISCUSSION

In the present study, it was observed that a major proportion of patients were having uncontrolled blood sugar despite of taking medicines or insulin which is a great concern. This implies that only diagnosis and treatment not sufficient to manage diabetes, along with it counseling and motivation for lifestyle modification is necessary.

Assessing overweight and obesity by BMI can't solve the

problem because assessment by waist hip ratio identifies 5-6 times more patients who were having central obesity and having central obesity increases LDL cholesterol and coronary heart disease risk. Presence of central obesity was not significantly different in males and females. In a study by Bonakdaran et al in Iran, obesity was 25.7% and abdominal obesity was 45.8% among diabetics. In our study, a high proportion of central obesity may be due to different dietary pattern and life style behavior among the study subjects. In the study by Malini DS et al among working women, 75% of detected Diabetics or IGT were having BMI >25 kg/m 2.9 Malini DS et al found, 92% of detected Diabetics and IGT had a WHR of ≥0.85 which was similar to our finding.9

It was found that 41% of study subjects were having history of hypertension, 16.5% were having high blood pressure at the time of examination (> 140/90 mm of Hg). In the study by Bonakdaran et al in Iran, they observed hypertension or history of hypertension in 51.6% diabetic patients.

When the study subjects were asked about some lifestyle related factors, more than 90% were sedentary workers and more than 50% were taking unhealthy diet. It was also observed that 58.5% were not practicing regular walking or any fitness activities. In a study by Shah VN et al, they observed that 51.23% diabetics knew that exercise can reduce blood sugar and 74.78% patients told that dietary modification can control blood sugar.10 In our study, 66% were not taking or occasionally taking fruits which was similar to findings of Shah VN et al.10 68.5% don't know diabetes can increase CHD risk and in the study by Shah VN et al, only few were aware that diabetes can cause heart attack. Since the work is mainly sedentary, they should be motivated for regular walking for 30-45 minutes or some fitness activities and encouraged for taking fruits and vegetables. More than 20% patients were currently using tobacco, therefore tobacco and alcohol consumption should be discouraged by awareness generation activities.

Investigations of lipid profile of 64 patients shows that about 50% of them were showing derangements of lipids which increase the risk of coronary heart disease. So screening of all diabetics for lipid profile along with appropriate measures will definitely reduce the risk.

Awareness about risk factors of coronary heart disease was low among diabetics. Even 68.5% don't know that diabetes increases the risk of CHD. Awareness generation along with behavior change communication activities is necessary for reduction of heart disease among diabetics.

CONCLUSION

A major proportion of patients were having uncontrolled blood sugar despite of taking medicines or insulin which is a great concern. Intervention in the form of lifestyle behavior modification may be helpful. Tobacco use among diabetics was more than 20% and about 60% were not practicing any fitness activity. More than 60% patients are not taking or occasionally taking fruits. 66% study subjects have high waist – hip ratio. Health and nutrition education can be undertaken by the junior doctors and dietician in the outpatient department.

Screening of all patients with diabetes mellitus for lipid profile and appropriate measures may definitely reduce the risk. Awareness about CHD risk factors was very low among diabetic patients which need intensive IEC activities and further research in M-health and informatics.

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