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Original Research Article

Ischemic Heart Disease in Patients with Type-II Diabetes Mellitus

Gaurav Singhal[1], Prateek Bhanot[2], Shyam Sunder[3]

[1]Associate Professor and Head of Cardiology Department, ESIC Medical College and Hospital, Jaipur, Rajasthan

[2]Specialist Anaesthesia, ESIC Model Hospital, Jaipur, Rajasthan

[3]Professor and Head of Medicine Department, ESIC Medical College and Hospital, Jaipur, Rajasthan

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Corresponding Author: Dr. Gaurav Singhal

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Abstract:

Estimates of CHD incidence in diabetic patients vary across studies and countries. Source data are remarkably heterogeneous with regard to selection criteria and risk assessment, and few observational studies provide information on the natural course of CHD in patients who periodically refer to hospital-based outpatient clinics. Furthermore, the natural history of CVD in diabetes is changing. Hospital based cross-sectional study was conducted on 200 type-2 DM patients. In present study, incidence of IHD was 17.00%. The results of this review revealed that there is a high prevalence rate of cardiovascular disease in patients with type 2 DM. Our study has suggested the dyslipidemia is associated with DM with increased TG, low HDL, high cholesterol and LDL. The increased Non-HDL/HDL and TG/HDL could be better indicator than single lipid abnormality which needs to be verified prospectively by including large population and controls. DM patients should be screened regularly for dyslipidemic condition and proper management should be instituted to risk associated with CHD and atherosclerosis.

Keywords: Type-2 DM, CAD, Lipid profile.

Introduction

Diabetes Mellitus (DM) is one of the most challenging public health problems in 21st century. There is an urgency for greater action to improve diabetes outcomes and reduce the global burden of diabetes now affecting more than 425 million people, of which one-third are people older than 65 years. If nothing is done, the number of people with diabetes may rise to 693 million in 2045, although positively the incidence has started to drop in some high-income countries. [2] At the same time, a further 352 million people with impaired glucose tolerance are at high risk of developing diabetes. By the end of this year, 4 million deaths will happen as a result of diabetes and its complications. [3] Alongside other noncommunicable diseases, diabetes is increasing most markedly in the cities of low and middle income countries. The IDF South-East Asia and Western Pacific regions are at the epicentre of the diabetes crisis: China alone has 121 million people with diabetes and India's diabetes population totals 74 million. African, Middle Eastern and Northern African and South-East Asian regions are expected to face the highest upsurge in the next 28 years. People from these regions develop disease earlier, get sicker and die sooner than their counterparts in wealthier nations. [4]

Diabetes is estimated to be responsible for 5.2% of all deaths. Since the Framingham Study, epidemiology has consistently shown that diabetes confers an increased risk for coronary heart disease (CHD) and cardiac mortality. [5]

Estimates of CHD incidence in diabetic patients vary across studies and countries. Source data are remarkably heterogeneous with regard to selection criteria and risk assessment, and few observational studies provide information on the natural course of CHD in patients who periodically refer to hospital-based outpatient clinics. Furthermore, the natural history of CVD in diabetes is changing. [6-7]

Methods & Materials

Type of study: Hospital based cross-sectional study

Sampling technique: Simple random sampling

Sample size:

$n=4pq/l^2$

p=80.00%

n=172

it is round off 200 cases

Inclusion criteria:

- Type 2 DM were defined as
    - Random blood sugar level >200 mg/dl and diabetic symptoms based on ADA diagnostic criteria
    - Fasting blood sugar level >126 mg/dl.
    - Diagnosed and receiving treatment for DM.
- Typical history of angina
- Know non coronary heart disease such as congenital or acquired valvular heart disease, heart failure (CCF) or arrhythmia
- Abnormal ECG finding
- Diagnosed CAD by invasive and non-invasive procedure

Exclusion Criteria:

1. Patients less than 18 years.
2. Not willing to participate in the study.

Data collection: Diagnosis of DM to CAD evaluation in years. Diabetic retinopathy, neuropathy and nephropathy were evaluated with appropriate clinical and laboratory testing. Lipid profile was done in every patient. TMT was performed in all patients irrespective of number of cardiac risk factors. Coronary angiography (CAG) was performed in positive, inconclusive, and equivocal TMT result. This study was approved by hospital ethical committee and informal consent was taken from all TMT positive patients. Treadmill exercise test (TMT) was performed according to Bruce protocol.

TMT was defined as +ve if there was >1 mm horizontal/down sloping ST-segment for 0.08 sec. after the J point. Coronary angiography was performed in all TMT +ve, inconclusive and equivocal cases. Coronary artery disease was considered if there was more than 60% stenosis. In case of >80% stenosis then appropriate Percutaneous Coronary Intervention (PCI) and CABG were done.

Statistical Analysis: Mean values of all parameters in subgroups was calculate by independent sample-t-test. To compare the distributions of dichotomous data viz. gender, presence of hypertension or diabetes and hyperuricemia, Chi-square test was used. Association between Hypertension and hyperuricemia was assessed by logistic regression model. Potential confounders were adjusted for. Pearson correlations were applied to evaluate the correlation between Hypertension and age, sex, height, weight, BMI, blood sugar, cholesterol & uric acid levels. All statistical analyses were perform using the SPSS package. A p-value of less than 0.05 was considered to be statistically significant.

Results

Table 1: Age wise distribution of study subjects

Age group in Yrs	No of study subjects	Percentage
<40	25	12.50
41-60	128	64.00
>60	47	23.50
Total	200	100.00

In our study, 64.00% patients were belonging to age group 41-60 Yrs followed by 23.50% patients were more than 60 Yrs age group.

Table 2: Sex wise distribution of study subjects

Sex	No of study subjects	Percentage
Male	111	55.50
Female	89	44.50
Total	200	100.00

In present study, 55.50% patients were male and 44.50% patients were female.

Table 3: Incidence of IHD in diabetes patients

Incidence of IHD	No of study subjects	Percentage
Present	34	17.00
Absent	166	83.00
Total	200	100.00

In present study, incidence of IHD was 17.00%.

Table 4: Association between Hb1Ac and IHD

IHD	Hb1Ac		p-value
	Mean	SD	
Present	7.26	1.23	0.01
Absent	6.89	0.69	

In present study, mean Hb1Ac was significantly higher in IHD patients (7.16±1.23%) as compare to without IHD (6.89±0.69%).

Table 5: Association between lipid profile and IHD

Lipid profile (mg/dl)	IHD				p-value
	Present		Absent		
	Mean	SD	Mean	SD	
Serum cholesterol	194.23	42.02	171.23	36.02	0.01
Serum triglyceride	155.23	56.23	135.23	24.62	0.01
LDL	126.32	38.25	101.23	12.25	0.01
HDL	34.12	6.32	46.32	7.12	0.01

In present study, mean serum cholesterol, triglyceride, LDL was significantly higher in IHD patients as compare to without IHD. Mean HDL was significantly lower in IHD patients as compare to without IHD.

Discussion

In the present study, the prevalence of cardiovascular disease in patients with type 2 DM in Iran was 17.00%.

In the study performed by Liu et al. in China, the prevalence of CVDs in patients with type 2 DM was 30.1%. [7] In addition, in a study conducted by Shi et al. on morbidity associated with chronic complications of DM in China, CVDs were the most common chronic complication of type 2 DM. [8] The rate of cardiovascular disease in patients with type 2 DM was 26% in South Korea. [9] The results of a study in Denmark in 2010 reported a complication rate of 32 to 40%. [10]

Patients with DM undergo periodic evaluation of renal and ocular complications; however, there is no specific plan to assess the related cardiovascular programs. Given the high prevalence of cardiovascular disease in patients with DM and lack of a clear plan for evaluating these complications, it is recommended that CVDs should be prevented by taking preventive measures such as regular exercise and developing cardiovascular periodic evaluation programs. The long life and quality of life of patients with DM depend on the progression and severity of chronic complications, especially CVDs. [11]

Conclusion

The results of this review revealed that there is a high prevalence rate of cardiovascular disease in patients with type 2 DM. Our study has suggested the dyslipidemia is associated with DM with increased TG, low HDL, high cholesterol and LDL. The increased Non-HDL/HDL and TG/HDL could be better indicator than single lipid abnormality which needs to be verified prospectively by including large population and controls. DM patients should be screened regularly for dyslipidemic condition and proper management should be instituted to risk associated with CHD and atherosclerosis.

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