Original Article

Study of impaired fasting blood sugar and coronary artery disease with reference to coronary angiography in diabetics

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Abstract

It is long known that both fasting BSL and postprandial BSL has an impact on coronary artery disease (CAD). **Aim and objectives**: To study the results of coronary angiography in diabetic individuals and to access whether CAD is more common in diabetic individuals with impaired fasting BSL or not. **Material and methods:** 101 patients with type 2 DM having cardiac symptoms were included in this study. All were subjected to fasting and postprandial BSL, HbA1C and coronary angiography. **Results:** Out of 94 patients with impaired fasting BSL, CAD was present in 100% of the patients, while out of 7 patients with well-controlled fasting BSL, CAD was present in only 28.57% of the patients. **Conclusion:** CAD is more common in patients with type 2 DM with impaired fasting BSL.

Keywords: Coronary angiography (CAG), coronary artery disease (CAD), diabetes mellitus (DM), fasting blood sugar level (FBSL), postprandial blood sugar level (PPBSL).

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INTRODUCTION

Both diabetes I and II are highly atherogenic states. Many patients who are newly diagnosed to have diabetes also suffer from macrovascular complications like myocardial infarction and stroke at a very young age. This could rather be astonishing but if you trace back, these individuals will be found to have missed the prediabetic status which exists a decade before the onset of diabetes[1]. This early detection of prediabetes could give them a golden opportunity for aggressive life style modification and meticulous check on impaired blood sugars. Prediabetes is no more an academic topic but a reality with a responsibility on doctors, who need to pick up more number of individuals with prediabetes. For a manifest diabetes, both impaired fasting BSL and postprandial BSL matters. Both are associated with microvascular and macrovascular complications in long run[2]. Our aim in this study is to see whether impaired FBSL is associated with macrovascular coronary events like angina and myocardial infarction.

AIMS AND OBJECTIVES

1. To see whether impaired fasting BSL in diabetic individuals is an independent risk factor for development of coronary artery disease.
2. To see whether there is a linear relationship between the severity of impaired FBSL and CAD.

MATERIAL AND METHODS

This study was conducted on the indoor patients of BharatiVidyapeeth Deemed University Medical College and Hospital, Sangli with Diabetes Mellitus (Type-2) during November 2013 to October 2015. This

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was an observational study. The study sample consisted of 101 patients with Diabetes Mellitus (Type 2) admitted with cardiac symptoms, without co-morbid conditions (hypertension, dyslipidemia, alcoholics or smokers), with or without electrocardiography (ECG) changes or who were willfully opting for coronary angiography.

Inclusion criteria

Diabetic individuals with cardiac symptoms, with or without ECG changes, who were willfully opting for coronary angiography. Cardiac symptoms comprises of: Chest pain, Sweating, Pain radiating to left arm, Breathlessness, Dyspnea on exertion, Palpitation.

Exclusion criteria

Type 1 diabetes mellitus, Age < 30 years, Diabetic individuals who were asymptomatic, Diabetic individuals with comorbid conditions like hypertension, dyslipidemia, alcoholism or smoking, Diabetic individuals with severe bleeding diathesis, Diabetic individuals with cardiogenic shock/ advanced CCF, Diabetic individuals with renal failure, Diabetic individuals with advanced age (> 90 years, relative).

Detailed clinical history was taken about the present and relevant past illness along with the history of habits (smoking and alcoholism) After clinical history thorough clinical examination was done.

Study tools:

After examination, all the patients were subjected for FBSL, PPBSL and HbA1C. However we limited our study and interpreted only FBSL: Blood sugar level - fasting and post prandial (FBSL and PPBSL), Glycosylated hemoglobin (HbA1C), Blood urea, Serum creatinine, Fasting lipid profile, 12 lead ECG (Electrocardiogram), 2 Dimensional Echocardiography (2D Echo), Coronary angiography

FBSL were arranged in 3 groups as follows

Sr. No.	FBSL (mg/dL)	Interpretation
1.	Upto 110	Well controlled
2.	111 – 125	Moderately impaired
3.	> 125	Severely impaired

OBSERVATIONS AND RESULTS

Table 1: Association of fasting BSL with CAD in DM

Fasting BSL (mg/dL)	CAD present (%)	CAD absent (%)	Total (%)	Significance
Upto 110	2 (28.57%)	5 (71.43%)	7 (100%)	Chi-square = 41.5925 p = 0.000
111 – 125	5 (100%)	0 (0%)	5 (100%)	
> 125	89 (100%)	0 (0%)	89 (100%)	

With well-controlled FBSL, CAD was present in only 28.57% cases while it was absent in 71.43%. CAD was present in all the cases with either moderately impaired or severely impaired FBSL.

CONCLUSION

UKPDS trial clearly demonstrates that tight glycemic control has marginal impact on microvascular events[3]. However impaired fasting blood sugar levels had a linear relationship with occurrence of CAD, which was endorsed in this study.

DISCUSSION

In this study, fasting BSL was impaired in 100% of diabetics with CAD whereas well controlled in only 28.57%. Poor glycemic control is considered as a major CV risk factor[4], which was found to be statistically significant (p = 0.000) in this study. Results from randomized controlled trials have demonstrated conclusively that the risk of microvascular complications can be reduced by intensive glycemic control in patients with type 1 and type 2 diabetes[5].

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