

Assessment of Prevalence and Risk Factors of Diabetes Mellitus Among Young Adults: An Institutional Based Study

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ABSTRACT

Background: Diabetes Mellitus is a global epidemic. The increase in Diabetes Mellitus prevalence is amongst low and middle-income countries. The present study was conducted to assess the prevalence and risk factors of diabetes mellitus among young adults.

Materials and Methods: The present study was population based cross sectional study carried out among 500 young adults of age 20 years and above. The data was collected using questionnaire. Questionnaire included information regarding age, sex, education, occupation, diet, smoking, alcoholism and family history of the disease. Anthropometric measurements of every study subject were taken i.e. weight, height, waist circumference & hip circumference. Blood pressure reading of all the subjects was also recorded. The blood samples were transported to lab for blood glucose estimation Data was analyzed using SPSS version 22. P value less than 0.05 was considered significant.

Results: The total study population was 500 in which 56.6% study subjects was of age group of 20-30 years and 43.4% of study subjects were of age group 31-40 years. 44.8% were males and 55.2% were females. 14% study subjects were found to be Diabetic. Among these 14% diabetic cases, 8.4% were old cases of Diabetes Mellitus and 5.6% were newly diagnosed Diabetes Mellitus cases. The prevalence of Diabetes Mellitus was higher (84.28%) in persons of age group 31-40 years. Diabetes was seen to be more prevalent among

females (57.14%), non-alcoholic (85.71%), non-smokers (97.14%), having no family history of diabetes mellitus (61.42%), obesity (84.28%), with higher waist-hip ratio (65.71%), high waist circumference (61.42%), sedentary lifestyle (80%). Diabetes was associated with 82.85% of hypertensive participants. Prevalence of Diabetes was significantly associated with age, Obesity and Hypertension.

Conclusion: Our study concluded that the prevalence of Diabetes Mellitus was higher in persons of age group 31-40 years and females. Prevalence of Diabetes was significantly associated with age, Obesity and Hypertension.


Keywords: Diabetes, Obesity, Hypertension.

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INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder resulting from a defect in insulin secretion, insulin action, or both. Insulin deficiency in turn leads to chronic hyperglycaemia with disturbances of carbohydrate, fat, and protein metabolism.¹ The disease is the most common chronic endocrine disorder, affecting an estimated 5%–10% of adults worldwide.^{2,3} According to International Diabetes Federation estimates, around 415 million people had DM in 2015 and this number is expected to rise to 642 million by 2040.⁴ According to Wild S et al the greatest increase in prevalence is, however, expected to occur in Asia and Africa, where most patients will probably be found by 2030. The increase in incidence in developing countries follows the trend of

urbanization and lifestyle changes, perhaps most importantly a "Western-style" diet.⁵ Major risk factors for diabetes have been identified and are currently used by the American Diabetes Association to guide screening strategies. Risk scores for diabetes fall into 2 primary categories that are conceptually distinct. Although risk scores are usually thought to quantify an individual's risk of developing disease, as with the Framingham Risk Score for coronary heart disease, most self-identified diabetes risk scores do not assess the risk of developing disease; rather, they assess the likelihood of having undiagnosed diabetes.⁶⁻¹¹ The present study was conducted to assess the prevalence and risk factors of diabetes mellitus among young adults.

MATERIALS AND METHODS

The present study was population based cross sectional study carried out in Department of Biochemistry, K. D. Medical College Hospital and Research Center, Mathura, Uttar Pradesh (India) among 500 young adults of age 20 years and above. Informed consent was obtained from all participants.

The data was collected using questionnaire. Questionnaire included information regarding age, sex, education, occupation, diet, smoking, alcoholism and family history of the disease. All the participants were explained about the nature and purpose of the study. Anthropometric measurements of every study subject were taken i.e. weight, height, waist circumference & hip circumference. Blood pressure reading of all the subjects was also recorded. The participants were then requested to remain fasting (for at least 8 hrs) on next morning for venous blood sample collection. After collection of fasting blood in fluoride vial they were given 75 Gms. of oral glucose and post-prandial blood sample was collected in fluoride vial after 2 hrs. The blood samples were transported to lab for blood glucose estimation (glucose-oxidase-peroxidase method). If a known case of Diabetes Mellitus on treatment came to be selected it was subjected to only fasting blood sugar estimation to see if blood glucose levels were controlled. Repeat testing was done on a different day for those study subjects whose FBS levels were in diabetic range and pre-diabetic range. Newly diagnosed cases of Diabetes Mellitus were started on treatment. For pre-diabetes, suggestions were given regarding physical activity, weight reduction, control of blood pressure and repeat FBS levels once a year. Criteria for diagnosis of Diabetes Mellitus as: Symptoms of Diabetes plus casual plasma glucose

concentration 200mg/dl (11.1mmol/l). Casual is defined as any time of day without regard to time since last meal. The classic symptoms of Diabetes include polyuria, polydipsia and unexplained weight loss or FPG 126 mg/dl (7.0mmol/l). Fasting is defined as no calorie intake for at least 8 hours or 2-h post load glucose 200 mg/dl (11.1 mmol/l) during an OGTT. The test should be performed as described by W.H.O., using a glucose load containing an equivalent of 75 gm. anhydrous glucose dissolved in water. Data was analyzed using SPSS version 22. P value less than 0.05 was considered significant.

RESULTS

The total study population was 500 in which 56.6% study subjects were of age group of 20-30 years and 43.4% of study subjects were of age group 31-40 years. 44.8% were males and 55.2% were females. 14% study subjects were found to be Diabetic. Among these 14% diabetic cases, 8.4% were old cases of Diabetes Mellitus and 5.6% were newly diagnosed Diabetes Mellitus cases.

The prevalence of Diabetes Mellitus was higher (84.28%) in persons of age group 31-40 years. Diabetes was seen to be more prevalent among females (57.14%), non-alcoholic (85.71%), non-smokers (97.14%), having no family history of diabetes mellitus (61.42%), obesity (84.28%), with higher waist-hip ratio (65.71%), high waist circumference (61.42%), sedentary lifestyle (80%). Diabetes was associated with 82.85% of hypertensive participants. Prevalence of Diabetes was significantly associated with age, Obesity and Hypertension.

Table 1: Socio-demographic profile of study subjects

Variables	N (%)
Age group	
20-30	283 (56.6%)
31-40	217 (43.4%)
Gender	
Male	224 (44.8%)
Female	276 (55.2%)
Total	500 (100%)

Table 2: Prevalence of Diabetes Mellitus among study subjects

Status	N (%)
Old Diabetic cases	42 (8.4%)
New Diabetic cases	28 (5.6%)
Total Diabetics	70 (14%)
Non- Diabetics	430 (86%)
Total subjects	500 (100%)

Table 3: Prevalence of DM and association between DM and each risk factor among study subjects

Risk factor	Category	Diabetes (n=70) n (%)	p-value
Age	20-30	11(15.71%)	<0.05
	31-40	59(84.28%)	
Sex	Male	30(42.85%)	
	Female	40(57.14%)	
Smoking	Current user	2(2.85%)	
	Non user/ex user	68(97.14%)	
Alcohol	Current user	10(14.28%)	
	Non user/ex user	60(85.71%)	
Family history	No	43(61.42%)	
	Yes	27(38.57%)	
Obesity	Non obese	11(15.71%)	
	Obese	59(84.28%)	
WHR (waist hip ratio)	Normal	24(34.28%)	
	> Normal	46(65.71%)	
WC (waist circumference)	Normal	27(38.57%)	
	> Normal	43(61.42%)	
Physical Activity	Sedentary	56(80%)	
	Moderate/heavy	14(20%)	
Blood pressure	Normotensive	12(17.14%)	
	Hypertensive	58(82.85%)	

DISCUSSION

The total study population was 500 in which 56.6% study subjects were of age group of 20-30 years and 43.4% of study subjects were of age group 31-40 years. 44.8% were males and 55.2% were females. 14% study subjects were found to be Diabetic. Among these 14% diabetic cases, 8.4% were old cases of Diabetes Mellitus and 5.6% were newly diagnosed Diabetes Mellitus cases. The prevalence of Diabetes Mellitus was higher (84.28%) in persons of age group 31-40 years. Diabetes was seen to be more prevalent among females (57.14%), non-alcoholic (85.71%), non-smokers (97.14%), having no family history of diabetes mellitus (61.42%), obesity (84.28%), with higher waist-hip ratio (65.71%), high waist circumference (61.42%), sedentary lifestyle (80%). Diabetes was associated with 82.85% of hypertensive participants. Prevalence of Diabetes was significantly associated with age, Obesity and Hypertension.

The Prevalence of Diabetes in India Study reported lower diabetes prevalence of 5.9 and 2.7% in urban and rural areas respectively with an overall prevalence of 4.3%.¹² The Chandigarh Urban Diabetes Survey also reported high prevalence of diabetes and prediabetes i.e. 11.1 and 13.2% respectively.¹³

Mohan et al reported that prevalence of Diabetes Mellitus increased with increase in age until 70 years.¹⁴

Krentz et al reported that the prevalence was higher in females.¹⁵

Poor physical activity was also associated with diabetes as supported by earlier study.¹⁶

Family history of DM is a strong predictor of the disease which is supported by the study.¹⁷ Kao et al found that high alcohol intake increases Diabetes Mellitus risk.¹⁸ Solberg L et al in his study had linked smoking with increasing insulin resistance which later on induces full blown Diabetes Mellitus.¹⁹

CONCLUSION

Our study concluded that the prevalence of Diabetes Mellitus was higher in persons of age group 31-40 years and females. Prevalence of Diabetes was significantly associated with age, Obesity and Hypertension.

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