

Cardiovascular Related Risk Factors in Newly Diagnosed Patients of Type 2 Diabetes Mellitus in Chattogram

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ABSTRACT

Background: Type 2 Diabetes Mellitus (T2DM) is increasing worldwide in particular in Bangladesh. Early diagnosis of T2DM, followed by proper management will help in leading a cardiovascular event free life. Although the event of cardiovascular profile in new T2DM patients is limited. This study aims to evaluate the extent of Cardiovascular disease (CVD) risk factors in newly diagnosed T2DM patients in Chattogram.

Materials and methods: A cross sectional observational study was conducted during the period from January to May 2025 to evaluate clinical laboratory and socio-demographic parameters of 528 newly diagnosed T2DM patients aged 30 years and above. The cardiovascular related risk factors were assessed collecting data by face to face interview and from history, pathological records done during diagnosis of diabetes mellitus. Data were compiled and assessed by SPSS version 23. Chi square test was done to see association between socio demographic characteristics and risk factors.

Results: Out of 528 diabetic patients, majority 192(36.4%) were diagnosed at age between 51-60 years. Females were predominant 307(58.1%). 303(57.4%) were service holder, 172(32.6%) belonged to lower middle class and 173(32.8%) passed primary school. 171(32%) of the patients lead sedentary life style and 431(81.6%) were non smoker. 185(35%) were overweight and 198(37.5%) were obese. 464(87.8%) had family history of DM, 263(49.8%) had hypertension and 210(39.7%) had high cholesterol level. This study revealed significant association of diabetes mellitus with education, occupation, physical activity, BMI and hypertension (p value <0.00%)

Conclusions: Less physical activity, high BMI and hypertension increases the morbidity of diabetes mellitus.

Key words: BMI; Diabetes mellitus; Hypertension; Obesity; Overweight.

Introduction

Globally the prevalence of Diabetes Mellitus (DM) and its accompanying complications is rising on a high rate. Present study suggests that, over 13.1 million adults in Bangladesh are living with DM, which is expected to rise to 22.3 million by 2045. Type 2 DM (T2DM) is the most common type of diabetes prevalent among these

persons.¹ The prevalence of Cardiovascular Disease (CVD) is strikingly high in South Asians when compared to Western populations. Moreover, South Asians are recognized to have an increased risk of premature CVD.² Among Bangladeshi, the adults shows a high prevalence of CVD.³ DM is a risk factor for cardio vascular diseases. Generally, DM shows a double fold increase of cardiac risk factors like dyslipidemia, hypertension, obesity which are independent of other risk factors. These risk factors aggravates with the onset of diabetes.⁴ Involvement of cardiovascular risk factors in diabetes leads to several complications ranging from undiagnosed ischemia to heart failure.⁵ In Bangladesh the risk factors for the development type 2 Diabetes Mellitus (DM) is determined by some modifiable factors like obesity, sedentary lifestyle, diet, smoking, physical inactivity, emotional stress and non-modifiable factors like family history of diabetes, age etc.⁶ Early diagnosis of T2DM following proper management will help to lead cardiovascular disease free life.⁷ For this purpose, it is necessary to evaluate cardiovascular profile of patients with T2DM. Most of these studies are based on populations from high-income countries, whereas there are differences in CVD risk depending on regions and ethnicities.⁸

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Multiple measures are needed to minimize this risk factors. These measures includes weight control, avoidance of smoking, control of hypertension, control of blood glucose level and maintain optimum lipid profile level. Lipid lowering agents helps to reduce cardiovascular risks significantly.⁹ In the current trend of rising incidence of diabetes in Bangladesh, it is necessary to evaluate the cardiovascular risk factors among newly diagnosed T2DM patients. This research study will be beneficial for physicians and stake holders to provide better treatment and management approach.

Materials and methods

Newly diagnosed 528 T2DM patients were included in this cross sectional study by purposive sampling. This study was conducted during the period from January to May 2025 in a tertiary hospital at Chattogram, Bangladesh. Data were collected by face to face interview by using a semi structured questionnaire. Before data collection, the purpose of the study was explained to each patients. A written agreement was obtained from each study participant and they were given the full right to withdraw from the study at any time. Data were collected from the participants at the selected tertiary hospital. Information regarding hypertension, lipid profile, BMI, physical activity, food habit, stress were collected from previous records. After data collection, analysis were done by SPSS version 23.

Exclusion criteria

- □ T2DM patients who were previously detected as diabetic positive.
- Pregnant women were excluded though they were first seen as diabetic positive.
- Age below 30 years.

Inclusion criteria

- □ Age 30 years and above
- □ Newly diagnosed T2DM patients
- □ Both gender.

Results

Table I Socio demographic profile of the respondents

Variables □	Frequency □	Percentage
Age group □	□	
30-40 years □	14 □	2.7
41-50 years □	175 □	33.1
51-60 years □	192 □	36.4
more than 60 years □	147 □	27.8
Gender □	□	
Male □	221 □	41.9
Female □	307 □	58.1

Variables □	Frequency □	Percentage
Occupation □	□	
Service holder □	303 □	57.4
Daily labor □	21 □	4.0
Businessmen □	91 □	17.2
Home maker □	113 □	21.4
Social class □	□	
Lower □	62 □	11.7
Lower middle □	172 □	32.6
Upper middle □	69 □	13.1
Middle class □	101 □	19.1
Upper class □	124 □	23.5
Education level □	□	
Illiterate □	33 □	6.3
Primary □	173 □	32.8
SSC □	121 □	22.9
HSC □	152 □	28.8
Graduate & above □	49 □	9.2

The study revealed that majority 192(36.4%) of the respondents developed DM between age group 51-60 years and 14(2.7%) developed DM at age 30-40 years. 221(41.9%) of the patients were female, 303(57.4%) were service holder, 124(23.5%) belonged to upper class, 62(11.7%) belonged to lower class, 33(6.3%) were illiterate and 173(32.8%) had primary level of education.

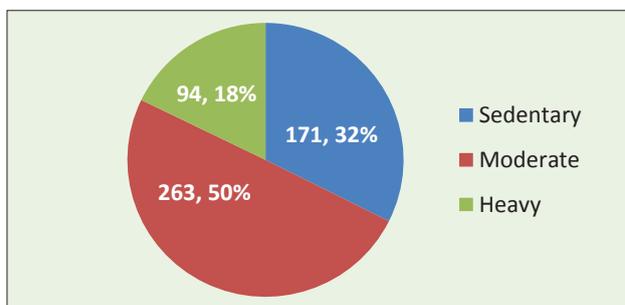


Figure 1 Pattern of physical activity (n=528)

The study revealed that majority 263(50%) of the patients do moderate physical work, 171(32%) lead sedentary life style and only 94(18%) do heavy work.

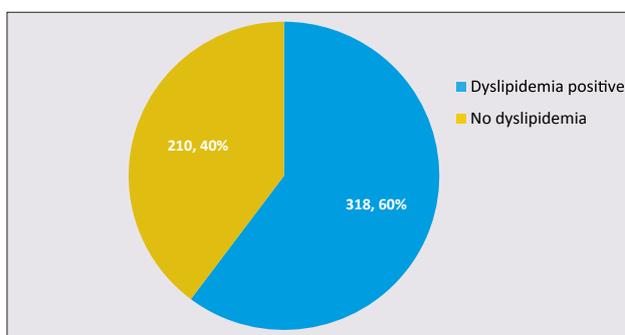


Figure 2 Distribution according to dyslipidemia (n=528)

The study revealed that majority 318(60%) of the patients had dyslipidemia.

Table II Distribution of respondents according to risk factors associated with DM (n=528)

Variables	Frequency	Percentage (%)
Smoking history		
Non-smoker	431	81.6
Ex-smoker	20	3.8
Light smoker (<10/DAY)	55	10.4
Moderate smoker (10-19/DAY)	22	4.2
BMI status (kg/m²)		
Normal (18 -24.9)	145	27.5
Over weight(25-29.9)	185	35.0
Obese (30-35)	198	37.5
Blood pressure status		
Normotensive	265	50.2
Hypertensive	263	49.8
Family history of DM		
Mother	162	30.7
Father	22	4.2
Siblings	121	22.9
Children	20	3.8
Multiple members	139	26.3
None	64	12.1

From the above study it is seen that among the 528 diabetic patients-majority 431(81.6%) were non smoker, 198(37.5%) were obese, 185(35%) were over weight, 263(49.85) were hypertensive and 464(87.8%) had family history of DM.

Table III Association between diabetes mellitus with physical activity and hypertension (n=528)

DM Status	HTN status		Total	P value
	Normotensive	Hypertensive		
Diabetes mellitus Physical activity	Sedentary 58	113	171	0.000
	Moderate 145	118	263	
	Heavy 62	32	94	
	Total 265	263	528	

DM Status	BMI			Total	p value
	Normal	Overweight	Obese		
Diabetes mellitus Physical activity	Sedentary 31	48	92	171	0.000
	Moderate 78	95	90	263	
	Heavy 36	42	16	94	
	Total 145	185	198	528	

The study reveals that among 528 diabetic patients, 263(49.8%) were hypertensive. Among the 171 patients who lead sedentary life, 113(66.08%) were hypertensive, among 263 patients who did moderate physical work,

118(44.8%) were hypertensive and among 94 patients who did heavy work 32(34.04%) were hypertensive. Out of 171 patients who lead sedentary life, 92(53.8%) were obese and 48(28%) were overweight. Significant association (p value= 0.000) is seen between diabetes mellitus with types of physical activity, BMI and hypertension.

Table IV Association of Diabetes Mellitus with education and occupation (n=528)

DM status	Occupation	Education					Total	p value
		Illiterate	Primary	SSC	HSC	Graduate		
DM	Service holder	15	96	65	99	28	303	0.000
	Labor Home maker	7	14	0	0	0	21	
	Business	11	23	32	18	7	91	
	Total	33	173	121	152	49	528	

The study revealed that among 303 service holder were diabetic, 15(4.9%) were illiterate and 28(9.2%) were graduates. Out of 21 daily labor 7(33.3%) were illiterate. Out of 91 home maker, 7(7.6%) were graduate and 11(12%) were illiterate. Among 113 businessmen 14(12.3%) were graduates. Significant association (p value=0.00) seen between Diabetes Mellitus with education level and occupation.

Discussion

The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030.¹⁰ In the current study 528 newly diagnosed type 2 diabetic patients were included to see the cardiovascular related risk factors. Majority 307(58.1%) of the patients were female and 221(41.9%) were males, which coincides another similar study done in Kushtia, Bangladesh.¹¹ A bulk share 192(36.4%) of patients were diagnosed as diabetic at the age between 51-60 years, 175(33.1%) were diagnosed at age between 41-50 years and only 14(2.7%) were diagnosed at age between 30-40 years where as in another study 43(32.6%) were diagnosed at age 40-50 years.¹¹ Out of 528 patients in this study, 303(57.4%) were service holder, 113(21.4%) were home maker, 91(17.2%) were businessmen and 21(4%) were daily labor. Meanwhile in another similar study, 101(25.3%) were service holder, 69(17.3%) were businessmen, 201(50.3%) were home maker and 27(7.3%) were unemployed.¹² Regarding education, Majority 173(32.8%) have passed primary school, 33(6.3%) were illiterate and 49(9.3%) were graduates, whereas in another similar research study 99(20.2%) did not have any formal education, 80(16.4%) had primary school level education and 158(32.3%) had

post secondary or above level of education.¹³ We observed significant association (p value=0.000) of diabetes mellitus with education and occupation. This study confirmed that majority 431(81.6%) were non smoker and 20(3.8%) were ex smoker, 55(10.4%) were light smoker and only 22(4.2%) were light smoker, whereas in another similar study 23.5% of the subjects were non smoker.¹¹ Regarding physical activity it was observed that 263(50%) of the patients did moderate physical work, 171(32%) lead sedentary life style and only 94(18%) did heavy work. Meanwhile in another study 603(37.3%) did moderate level of physical activity, 964(59.6%) lead sedentary life style and 50(3.1%) did heavy work.¹⁴ 145(27.5%) of diabetics in this study showed BMI within normal range but obesity and overweight is found to be related to diabetes. 185(35%) of the diabetic patients were overweight and 198(37.5%) were obese. Data from another study shows 262(16.2%) had normal BMI, 23(1.4%) were underweight, 271(16.8%) were overweight and 1061(65.6%) were obese.¹⁵ the current shows significant association between diabetes mellitus with obesity and overweight (p value=0.000). The current study observed that majority 318(60%) of the patients had high cholesterol level which is related to diabetes, where as in the study of Mumu observed high serum triglyceride and cholesterol.¹² Among the 528 diabetic patients 263(49.8%) had hypertension and significant association (p value=0.000) was seen between diabetes mellitus with physical activity and hypertension. Meanwhile in another similar study 78 (59.1%) were hypertensive.¹¹ The findings of this study reported that the socio demographic factors like occupation and education has huge effect in the development of diabetes mellitus. Sedentary life style, overweight, obesity, hypertension and high cholesterol level is associated as risk factors in diabetes mellitus. The risk factors can be reduced by the implementation of healthy public policy, adequate knowledge regarding controlling factors of diabetes, and healthy lifestyle interventions. The primary health care facilities should execute regular follow-up, monitor, proper advice and intervention programs to reduce the incidence of risk factors in type 2 diabetes patients.

Limitation

This study was conducted from a single center which does not reflect the condition of whole country.

Conclusion

This research study concludes that cardiac related risk factors are associated with newly diagnosed type 2 diabetes mellitus. Risks factors like poor physical activity, BMI, hypertension, dyslipidemia, smoking increased the risks of diabetes mellitus. This findings suggests planning for effective policy making and raising awareness for better management and adopting life style modification.

Disclosure

The authors declared no competing interest.

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