

Socio-Economic and Clinical Condition of Some Registered Diabetes Patients in BIRDEM: A Case Study

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Abstract

Diabetes is a major health problem of all countries of the world including Bangladesh. Most of the people do not have proper knowledge and the medical facilities. As a result the disease is in severe form among many diabetic patients. We took a random sample of size 2000 and then studied the different socio-economic, clinical history of the selected patients. Results show that the age, area, family history etc. are the important risk factors for developing diabetics. It is evident that majority of the patients (77.6 percent) do not take physical exercise. Thus physical inactivity or sedentary life is also risk factor for developing diabetes. Also, it is observed that blood glucose level is associated with most of the variables such as age, income etc. and blood glucose level is highly associated with the annual family income and body mass index (BMI).

Keywords: Diabetes, Association, Bangladesh

Introduction

Diabetes mellitus (DM) is characterized by chronic elevation of blood glucose level above normal value. Now-a-day's diabetes is an all knowing disease. The scene has change very powerfully. It afflicts the rich as well as poor. At present it is observed that the number of people having DM increasing very rapidly. All of us are at risk of developing diabetes. Diabetes mellitus is a chronic condition that arises when the pancreas (an organ in the body that produces insulin) does not produce enough insulin or when the body cannot use the insulin produced effectively. Most of our food intake is turned into glucose, a form of sugar, for our bodies to use for energy. The pancreas, an organ near the stomach, produces a hormone called insulin, which enables our muscles and other tissues to absorb glucose from the blood. Without insulin our body cannot get the energy it needs from our food. As a result, the person cannot use the glucose in the food he or she eats. This can lead to abnormal blood glucose levels. The cause of diabetes continues to be a mystery, although both genetics and environmental factors such as obesity and lack of exercise appear to play roles. There are different types of diabetes, and the causes for the elevations in blood sugar differ depending on the type of diabetes. Several groups of workers have reviewed the classification of this complex disease and an international working group sponsored by the National Diabetes Data Group (NDDG) of USA have developed a Classification later accepted by the expert committee on Diabetes of the WHO are given below

- Insulin dependent diabetes mellitus (IDDM) or Type-1 diabetes
- Non-insulin dependent diabetes mellitus (NIDDM) or Type-2 diabetes

➤ Gestational Diabetes mellitus (GDM)

Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine and Metabolic Disorders (BIRDEM) at Shahbag, Dhaka, Bangladesh is a 600-bed multidisciplinary hospital complex of the Diabetic Association of Bangladesh. Diabetic Association of Bangladesh (DAB) was established on 28th February 1956 in Dhaka at the initiative of the late National Professor M Ibrahim and a group of social workers, philanthropists, physicians and civil servants. Diabetic Association of Bangladesh (DAB) is a nonprofit voluntary socio-medical organization registered with the Ministry of Social Welfare under the Society's Registration Act, 1860.

In Bangladesh, diabetes affects all segments of the population and is one of the leading causes of premature morbidity and mortality, and requires life-long healthcare services (Imam, 2012). McCarty et al (1994) used data from population-based epidemiological studies and estimated that the global burden of diabetes was 110 million in 1994 and that it would likely more than double to 239 million by 2010. WHO (1998) also produced a report using epidemiological information and estimated the global burden at 135 million in 1995, with the number reaching 299 million by the year 2025. Amos et al (1997) estimated the global burden of diabetes to be 124 million people, and projected that this would increase to 221 million people by the year 2010. Mahtab and Chowdhury (2002) reported that out of a total of over 14,000 people with diabetes registered BIRDEM in 2000, 68% were male and 32% were female. Further 53% of the women with diabetes were inhabitants of rural areas and 47% were city dwellers. The estimated value of diabetic patient for Bangladesh in the year 2000 was 3.2 million, which will be increased to 11.1 million by the year 2030 (Wild, *et al.*, 2004). A number of studies have been conducted in Bangladesh on diabetes mellitus patients and revealed an increasing prevalence of diabetes mellitus in both rural and urban populations (Sayeed, *et al.*, 1997; Sayeed, *et al.*, 2003; Rahman and Islam, 2007; Sayeed, *et al.*, 2013; Islam, *et al.*, 2013; Saquib, *et al.*, 2013; Akter, *et al.*, 2014; Sayeed, *et al.*, 2014; Rahman, *et al.*, 2015). This paper finds the association among the socio- demographic factors which were responsible for developing diabetes mellitus.

Methodology

To meet the objective of the study, a random sample of size 2000 is selected from the patients of BIRDEM and then studied them. We selected the variables as our interests for comparing which were demographic variables (age, sex, family history of diabetes or heredity etc.), socioeconomic variables (education, income) and clinical variables (blood pressure, Blood glucose level, Body Mass Index (BMI), etc.). The collected data were analyzed by IBM SPSS Statistics version 22.

Results and Discussions

The distribution of different characteristics of the selected patients is presented in Table 1. It is evident from the Table 1 that highest number of patients (34.0 percent) belongs to age group 41-50. A considerable number of patients (29.1 percent) are in age group 31-40 and (18.8 percent) are in age group 51-60. Among the patients, 62.7 percent patients age is 40 and above. Hence, this clearly indicates that the older age (above 40 years) is one of the risk factor for developing diabetes.

Table 1: Frequency distribution of different characteristics of the selected patients

Age (in Years)	Frequency	Percent	Sex	Frequency	Percent
≤20	54	1.1	Male	1111	55.55
21-30	353	7.1	Female	889	44.45
31-40	1456	29.1	Total	2000	100
41-50	1701	34.0	Area		
51-60	940	18.8	Rural	676	33.8
61-70	381	7.6	Urban	1150	57.5
70 +	115	2.3	Semi-Urban	174	8.7
Total	5000	100.0	Total	2000	100
Education level			Occupation		
Illiterate	142	7.1	Service	580	29
Primary	487	24.35	Business	407	20.35

S.S.C	419	20.95	Farmer	113	5.65
H.S.C	283	14.15	House Wife	777	38.85
Under-Graduate	270	13.5	Retired & Others	123	6.15
Graduate and above	399	19.95	Total	2000	100
Total	2000	100	Annual Income (Taka)		
Doing physical exercise			≤ 10000	107	5.35
Yes	447	22.35	10001-30000	274	13.7
No	1553	77.65	30001-50000	490	24.5
Total	2000	100	50001-70000	139	6.95
Heredity			70001-90000	122	6.1
Yes	997	49.85	90001-110000	306	15.3
No	791	39.55	110000+	562	28.1
Unknown	212	10.6	Total	2000	100
Total	2000	100	Diastolic Blood Pressure		
Systolic Blood Pressure			DB Norm	1845	92.25
SB Norm	1824	91.2	SH on border line	9	0.45
SH on border line	83	4.15	SH exists	146	7.3
SH exists	93	4.65	Total	2000	100
Total	2000	100	Glucose Level in mmol/l (Fasting)		
Glucose Level in mmol/l (2 hours after Glucose load)			≤ 10.00	913	45.65
≤ 10.00	76	3.8	10.01-15.00	596	29.8
10.01-15.00	541	27.05	15.01-20.00	348	17.4
15.01-20.00	551	27.55	20.01-25.00	105	5.25
20.01-25.00	427	21.35	25.01-30.00	27	1.35
25.01-30.00	255	12.75	30.01+	11	0.55
30.01+	150	7.5	Total	2000	100
Total	2000	100	BMI		
BMI			Under Weight	139	6.95
Under Weight	139	6.95	Normal Weight	1099	54.95
Normal Weight	1099	54.95	Over Weight	762	38.1
Over Weight	762	38.1	Total	2000	100
Total	2000	100			

It is evident from the Table 1 that 55.6 percent patients belong to male category. This may be because male are more conscious than the female. Besides under our present social conditions male get more facilities and freedom to access medical facilities. Among the diabetic patients, 33.8 percent come from rural area, 57.5 percent comes from urban and 8.7 percent comes from Semi-urban. The large portion may concentrate in urban for the following reasons; urban people are more conscious about health than the rural people. Medical facilities and communication facilities are better in urban areas than that of rural. Diabetes among rural population may be less because they are exposed to hard physical labor. The incidence of the disease is higher in educated people. Also, educated people are more conscious about their health and they come to hospital in large proportions. Majority of female patients (38.8 percent) are housewives. It is evident that higher socio-economic class bears the risk of developing diabetes. It may conclude that majority of the patients (77.6 percent) do not take physical exercise. This is why may be a large number of patients are suffering from various complications of diabetes. Thus physical inactivity or sedentary life is also risk factor for developing diabetes. We can conclude that family history is a major influencing factor for developing diabetes (Table 1). It is evident from the Table 1 in fasting blood glucose test shows that 45.6 percent patients have blood glucose level less than or equal to 10 mmol/l, whether Non-fasting glucose tolerance test shows that 3.8 percent patients have blood glucose level less than 10 mmol/l. We classify BMI as under-weight, normal-weight and over-weight. Numbers of under-weight and over-weight together constitute about 55.1 percent diabetics. Over weight diabetics are 38.2 percent. Thus over weight is a

risk factor for developing diabetes. Now, it is trying to test the association between Blood glucose level and different variables considered in this study. Table 2 represents the distribution of blood glucose level and Body Mass Index (BMI).

Table 2: Distribution of blood glucose level and Body Mass Index (BMI)

Blood Glucose Level in mmol/L	BMI			Total	Chi-square
	Under Weight	Normal Weight	Over Weight		
≤ 10	30	430.4	426.4	886.8	204.15
> 10	107.6	669.2	336.4	1113.2	
Total	137.6	1099.6	762.8	2000	

On the basis of the values of chi-square we may conclude that BMI and Blood glucose level of diabetics significantly associated. Table 3 displays the distribution of Age and Blood Glucose Level.

Table 3: Distribution of Age and Blood Glucose Level

Age in Years	Blood Glucose Level in mmol/L		Total	Chi-square
	≤ 10	> 10		
≤ 40	302.8	437.6	740.4	14.11
> 40	584	675.6	1259.6	
Total	886.8	1113.2	2000	

We may say that age and Blood glucose levels of diabetics are significantly associated at 5 percent level of significance i.e., there are higher blood glucose level in the higher age. Table 4 depicts the distribution of Systolic BP and Blood Glucose Level.

Table 4: Distribution of Systolic BP and Blood Glucose Level.

Systolic BP	Blood Glucose Level in mmol/L		Total	Chi-square
	≤ 10	> 10		
SB Norm	795.2	1030.4	1825.6	13.28
SH on border line	39.6	38	77.6	
SH exists	52	44.8	96.8	
Total	886.8	1113.2	2000	

From Table 4, we may conclude that Systolic Blood pressure is dependent on Blood glucose level. In other words, Systolic Blood pressure and Blood Glucose Level of diabetics are significantly associated. Table 5 shows the distribution of Income level and Blood Glucose Level.

Table 5: Distribution of Income level and Blood Glucose Level

Income level	Blood Glucose Level in mmol/L		Total	Chi-square
	≤ 10	> 10		
Low	37.6	70.4	108	64.14
Medium	100.8	188.4	289.2	
Moderately high	261.6	355.6	617.2	
High	486.8	498.8	985.6	
Total	886.8	1113.2	2000	

We can say that blood glucose level is dependent on Income level. In other wards blood glucose level is significantly varies with income level of the diabetics. There are more diabetic patients in the high income group whose blood glucose level is also high. From the tests of independence we observed that blood glucose level is associated with most of the variables considered in this study and highly associated only with the annual family income and body mass index (BMI).

Conclusion

The World Health Organization (WHO) has already predicted that developing countries will bear the brunt of the diabetes epidemic in the 21st century including Bangladesh. The prospects are really alarming after we have seen the ever increasing crowd of patients in the BIRDEM hospital. From age distribution of diabetics it is found that the age group 41-50 constitutes the highest number of diabetics, which is about 34 percent. Thus we can say that the older age (above 40 years) is one of the risk factors for developing diabetics. Area is also an important factor for the diabetic patients. From the family history of diabetes we found that about 49.9 percent diabetics have family history of diabetes where as 39.9 percent do not have family history of diabetes. It is evident that majority of the patients (77.6 percent) do not take physical exercise. Thus physical inactivity or sedentary life is also risk factor for developing diabetes. Body mass index (BMI) is also an important indicator for the obesity of the diabetic patients. Also, from the test of independence we can say that there was high blood glucose level in high age group. We observed that blood glucose level is associated with most of the variables such as age, income etc. and blood glucose level is highly associated with the annual family income and body mass index (BMI).

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