RELATIONSHIP BETWEEN TYPE 2 DIABETES MELLITUS AND DEPRESSION

Rumela Ali[1], Dr Anisur Rahman[1]

[1]Department of Clinical Psychology, University of Dhaka

Abstract: The purpose of the study is to find out the relationship between T2DM and depression. The sample of the study comprised 652 patients of whom 348 were males and 304 were females and were taken from outpatient department (OPD) of Bangladesh Institute of Health Science (BIHS) Bashaboo, Dhaka and Bangladesh Institute of Research and Rehabilitation on Diabetes, Endocrine and Metabolic Disorder (BIRDEM), Shahbagh, Dhaka. Quantitative research methods were used in the study. The measures used in the study were: Depression Scale of Uddin & Rahman, Blood glucose was measured by glucometer called accu-check, in-depth interview and observational reports. The age range was between 20 and 80 years and their average age was 51±11 years. Their educational level was from illiteracy to doctorate degree. Duration of T2DM of the subjects were divided in three phases – (i) less than 1 years (14.9% males and 17.2% females), (ii) 1-10 years (17.6% males and 17.2% females) and (iii) above 10 years (20.9% males and 12.3% females). More than fifty percent were male and thirty eight percent females were married. In respect of occupation 41.1% female responded were housewives, 2.5% female responded were service holder, 0.5% female responded were business persons, 1.5% females were retired and other females 1.1%; whereas of male Ss 20.9% were jobholders, 14.3% were businessmen, 12.6% were retired persons and others were 5.7%. Seventy five percent of the sample showed minimal depression, 14.7% had mild depression, 5.8% had moderate depression and 4.4% showed severe depression.

Keywords: Type 2 Diabetes Mellitus (T2DM), Depression

Introduction

Depression is one of the co-morbid conditions to the people who suffer from Type 2 Diabetes Mellitus (T2DM). Depressive patient having grossly uncontrolled diabetes gradually become victim of slow and painful experience extending over years. Patients with T2DM have a high prevalence of affective illness, with 11–15% meeting the criterion of major depression. Study showed that there is a strong association between T2DM & depression[1]. In Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV-TR)[2], criteria for major depression are available[3]. Major Depression was found to be a chronic or recurrent illness in most patients with T2DM[4]. According to World Health Organization, at least 177 million people worldwide suffer from diabetes. By 2030, it is expected that the burden of diabetes will affect more than 439 million adults worldwide or 7.7% of the global population [5].

The association of depression with diabetes includes poor adherence to treatment, poor glycaemic control, and greater frequency of macro and micro vascular complication, sexual dysfunction and impaired quality of life [6, 7]. Being diagnosed as diabetes is the cause of a major life stress. It requires a large number of physical and mental accommodations. The individual must learn about a complex system of dietary and medical interventions. Lifestyle, work schedules may have altered. This can consume a lot of energy for both the individual and his or her family. Just as important, are the psychological adjustments. One must adjust to a new view of oneself. This is particularly difficult to manage diabetics patient gets to be free from depressive symptoms. During this period, diabetic patient needs psychological support. Caregiver may help to manage patient's diabetes as well as depressive symptoms. Empirical studies strongly suggest that depression is more prevalent among adults with diabetes than among the general population [8]. A recent study has shown that leptin in the limbic system and could have a potential role in emotional processes. Increasing the leptin signals in brain may be a new approach to treat depressive disorders [9].

Over the past years, research has evidenced a high prevalence of depression in patients with diabetes and its deleterious relationship to the metabolic control [10]. Most researchers agree that an interaction of both physiological (neurochemical and neurovascular changes) and psychosocial factors (decreased quality of life, chronic stress associated with daily diabetes management) interact to increase psychological vulnerability to depression [11]. The prevalence is rising in Bangladesh currently 10% of the adult population have diabetes and among them at least 2-3% does have depression of varying degrees of severity [12].

Materials and Methods

Six hundred and fifty two diabetes patients constituted the purposive sample of this study. They were attending at the outpatient department (OPD) of Bangladesh Institute of Health Science (BIHS) Bashaboo, Dhaka-1214 and Bangladesh Institute of Research and rehabilitation on Diabetes, Endocrine and Metabolic Disorder (BIRDEM), Shahbagh, Dhaka. The ages of the respondents were between 20 and 80 years with an average age of 51±11. To find out the rate and level of depression investigator administer Depression scale[13]. The responders were divided into three groups, as described below:

Group A: In this group, two hundred nine patients were included. They were newly diagnosed as diabetic (duration of diabetes was between 0 and 12 months).

Group B: Two hundred twenty seven patients suffered from diabetes for 1 to 10 years were in this group.

Group C: The third group constituted by two hundred sixty patients having diabetes for more than 10 years.

Research Design: In the present study, survey method was used to find out the relationship between T2DM and depression. Quantitative data collection method was employed to find out the relationship between T2DM and depression.

Procedure: Sixteen hundred and fifty two cases were selected purposively from Bangladesh Institute of Health Science, Bashaboo, Dhaka-1214 and Bangladesh Institute of Research and rehabilitation on Diabetes, Endocrine and Metabolic Disorder (BIRDEM), Shahbagh, Dhaka. Depression scale was administer for the subjects to assess the level of severity of depression. Depressive symptoms were rechecked with the help of Diagnostic and Statistical Manual of Mental Disorder (DSM-IV-TR). To find out the connection between blood glucose level and depression, means, standard deviations co relational analysis were conducted.

Means and Instruments of collecting data

1. Socio-demographic questionnaire includes age, sex, education, marital status, socio-economic status, etc to compare relationship between socio-demographic variables, T2DM and depression.

2. Accu-check active-blood glucose measuring instrument, manufactured by Sanofi Aventis used for estimation of blood glucose level.

3. Depression Scale (13) was used to detect the current level of depression. A depression scale was developed and tested by the researchers in Bangladesh for the first time. This is a 5-point rating scale. Ideas of these items were taken from some foreign scales such as Beck Depression Inventory (BDI), Hospital Anxiety Depression Scale (HADS). This research was conducted in 3 phases. The reliability of this scale was done by measuring internal consistency (through conducting split-half reliability) and test-retest reliability. Rating scales were discrete as follows: 'not at all applicable=1'; 'not applicable=2'; 'uncertain=3'; 'a bit applicable=4'; and 'fully applicable=5'.

4. Observational report was overseen to establish the observable features and to monitor changes after applying psychological managements. Facial expression, body language as for example: gesture and posture, tone of voice, eye contact, speech, mood (anxious, depressed), motor and social behavior were the observation report indicators of observations. This report was collected during the beginning, middle and last part of the sessions.

Data processing and analysis: Data were analyzed using the Statistical Package for the Social Sciences (SPSS), Version 11.0. Correlation analysis was done to explore correlations between the variables. Quantitative data from self-rating of patient's problems, assessment of functional level rating and psychometric tools (Depression Scale) were used for analyzing the test result.

Result

Table 1: Socio-demographic Characteristics of the respondents.

Demographic Variables	Male		Female		Total	
	Frequency	%	Frequency	%	Frequency	%
Age						
30-40 years	3	0.5	22	3.4	25	3.8
31-40 years	49	7.5	54	8.3	103	15.8
41-50 years	94	14.4	119	18.5	213	32.7
51-60 years	110	16.9	75	11.5	185	28.4
60+	92	14.1	34	5.2	126	19.3
Total	348	53.4	304	46.6	652	100.0
Education						
Illiterate	25	3.8	52	8.0	77	11.8
Primary	53	8.1	109	16.7	162	24.8
Secondary	100	15.3	106	16.3	206	31.6
Degree	85	13.0	26	4.0	111	17.0
Hons.	43	6.6	4	0.6	47	7.2
M.A & others	42	6.4	7	1.1	49	7.5
Total	348	53.4	304	46.6	652	100.0
Occupation						
House wife	0	0	268	41.1	268	41.1
Service	136	20.9	16	2.5	152	23.3
Business	93	14.3	3	0.5	96	14.7
Retired	82	12.6	10	1.5	92	14.1
Others	37	5.7	7	1.1	44	6.7
Total	348	53.4	304	46.6	652	100.0
Duration of T2DM						
<1 year	97	14.9	112	17.2	209	32.1
1-10 years	115	17.6	112	17.2	227	34.8
10+ years	136	20.9	80	12.3	216	33.1
Total	348	53.4	304	46.6	652	100.0
Marital Status						
Unmarried	2	0.3	1	0.2	3	0.5
Married	334	51.2	246	37.7	580	89.0
Divorced	2	0.3	0	0	2	0.3
Separated	1	0.2	3	0.5	4	0.6
Total	348	53.4	304	46.6	652	100.0

Table 2: Quantitative outcome of depression and T2DM

Depression score	Frequency	Percent
Minimal (30-100)	489	75.0
Mild depression (101-114)	96	14.7
Moderate depression (115-123)	38	5.8
Severe depression (124-150)	29	4.4
Total	652	100.0

Table 2 shows that 75% patients had minimal level of depression, 14.7% had mild level of depression, 5.8% had moderate level of depression and 4.4% suffered from severe depression.

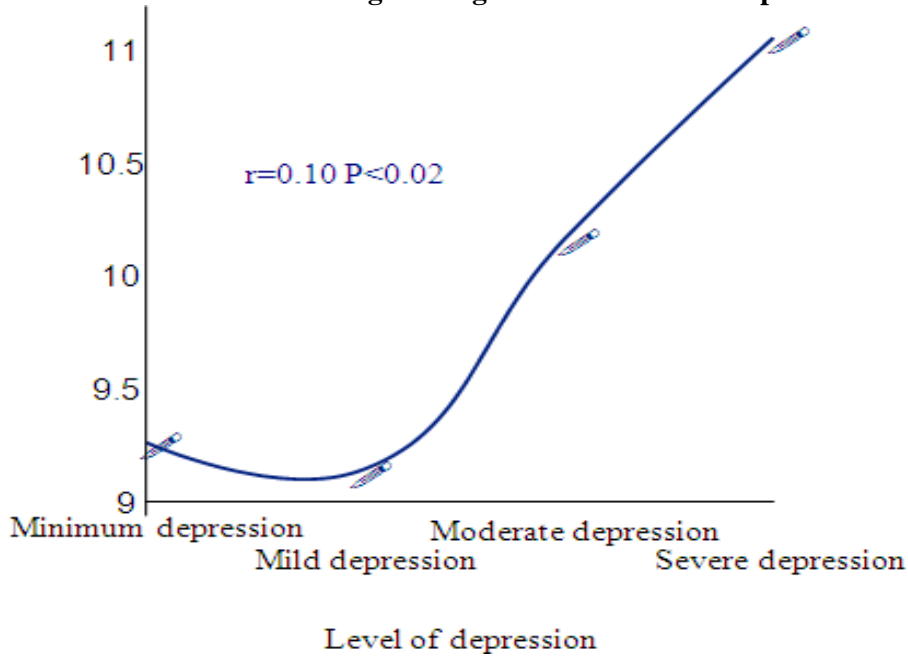**Figure 1: Linear curve of fasting blood glucose and level of depression**

Figure 1 shows the linear relationship between level of depression and fasting blood glucose level. A significant correlation (r = 0.10 P < 0.02) was found between depression level and fasting blood glucose level. Positive relationship implies that level of depression tends to increase with fasting blood glucose level.

Figure 2: Linear relationship between blood glucose level after breakfast and level of depression
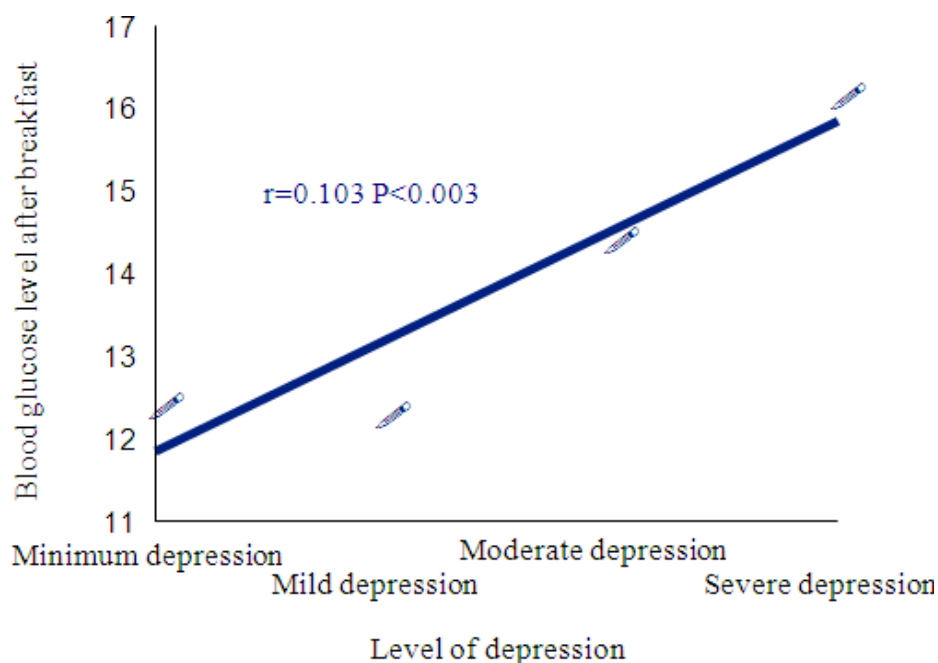

Figure 2 shows the linear relationship between level of depression and fasting blood glucose level after breakfast. Again, a significant correlation (r = 0.103 P < 0.003) was found between depression level and fasting blood glucose level after breakfast. Significant relationship implies that level of depression tends to increase with fasting blood glucose level after breakfast.

Discussion

This study showed that there is a significant relationship between blood glucose level and depression in diabetic patients. About one forth of the subjects of this study had varying degrees of depression (Table 1). Anderson[3] observed that diabetic patients are more vulnerable to develop depression. In order to maintain sound life diabetic patients have to follow diet, prescription and prescribed changes their life style. Internal factors such as low self-esteem and other environmental factors (i.e. social stigma, financial crisis) makes them upset. As a result, they are unable to maintain new routine. Therefore, blood glucose remains high and develop depressive symptoms. A study[14] showed that there is an association between uncontrolled blood glucose level and depression. According to their findings, depression has been associated with hyperglycemia diabetes-related complications, and perceived functional limitations of diabetes. It was found that there was a significant positive correlation (r = 0.10 P < 0.02) between depression and fasting blood glucose level (Figure 1). Positive relationship implies that the level of depression tends to increase with fasting blood glucose level.

To find out whether there was any relationship between non-fasting state and depression, correlation, regression analysis are done (Figure 2) and it was found that there was a significant relationship (r = 0.103 P < 0.003) between blood glucose level after breakfast and depression. After diagnosing diabetes a number of patients become depressed due to the stress of disease and treating diabetes. Some other patients have severe depression. If patients are suffering from both depression and diabetes, they often make each other worse. When patients feel depressed, they might not follow all diabetes treatment regimens. On the other hand, for some patients, depression might heighten appetite and stress of being depressed, increases insulin resistance and makes the blood glucose level higher. As a whole, it would become a vicious cycle and makes total scenario worse. In clinical practice, identification of depression in diabetes is often overlooked for a variety of reasons such as societal disapproval of depression, complicity between the physicians and the patients (e.g. not discussing depressive symptoms), and wrongly considering depression as a 'normal consequence of difficult medical illnesses. The potential benefits of treatment are thereby missed. That is why depression often becomes undiagnosed and revolves into silent killer for diabetic patients. Another study found the same results according to their findings; major depressive disorder was more frequent in diabetic patients with poor glycemic control than those with good glycemic control[15]. Above findings also corresponds by another group of researcher they suggests that, when depression accompanies with diabetes, there is evidence of poorer glycemic control, decreased physical activity, higher obesity and potentially more diabetes end-organ complications and impaired function[16]. A significant relationship between uncontrolled blood glucose level and depression was observed.

Conclusion

One fourth of the T2DM patients do have depression and it is more in female. Duration of T2DM of the subjects were divided in three phases – (i) less than 1 years (14.9% males and 17.2% females), (ii) 1-10 years (17.6% males and 17.2% females) and (iii) above 10 years (20.9% males and 12.3% females). More then fifty percent were male and thirty eight percent females were married. In respect of occupation 41.1% female responded were housewives, 2.5% female responded were service holder, 0.5% female responded were business persons, 1.5% females were retired and other females 1.1%; whereas of male Ss 20.9% were jobholders, 14.3% were businessmen, 12.6% were retired persons and others were 5.7%. Seventy five percent of the sample showed minimal depression, 14.7% had mild depression, 5.8% had moderate depression and 4.4% showed severe depression.

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