

Study to compare severity of depression between uncomplicated and complicated diabetes mellitus patients

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Abstract

Background: Diabetes Mellitus and Depression are two most co-morbidities that are least emphasized. Prompt psychological interventions in Diabetic patients help in effective diabetic control and prognosis of the individual. Endocrinological disorders are strongly associated with mood disorders and vice versa. **Methods:** Diabetic patients with and without complications were divided into two groups and severity of Depression was assessed in the two groups. Each group has 40 patients and diagnosis of Depression was confirmed according to ICD-10. HAM-D rating scale was used to assess severity of Depression. **Results:** Prevalence of Depression was more common in Diabetic patients with complications. Nearly 40% patients were suffering from depression cross-sectionally. In complicated group it was 72.5% and Uncomplicated group it was 15%. Among the depressive patients, 24 (60%) of complicated cases showing depression and the severity is mild in 14 (35%), moderate in 5 (12.5%) and severe in 5 (12.5%). In Contrast, only 1 (2.6%) of uncomplicated cases has shown moderate depression with a significant p-value of 0.001. **Conclusions:** Depression is strongly associated with proper glycemic control and associated co-morbidities with complications in Diabetes Mellitus patients. So every Diabetic patient should be thoroughly screened for underlying Mood Disorder

Key Words: Diabetes Mellitus, Depressive Episode, International Classification of Diseases-10, Hamilton Rating scale for Depression

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INTRODUCTION

Diabetes mellitus comprises a group of common metabolic disorders that share the phenotype of hyperglycemia. Diabetes is one of the most complicated chronic medical conditions where a high degree of patient self-management is required to ensure optimal outcomes. Conversely, chronic stressors and psychiatric symptoms may markedly interfere with adherence to self-care regimens (Eg: Diet, Exercise, Medications and Substance Abuse) The combination of diabetes and depression is associated with decrease in functional abilities and self-care.¹⁻⁴ The comorbidity of depression and diabetes can be seen as a prototypical example of mental/physical comorbidity. The prevalence of both conditions is growing, and depression

is twice as frequent in people with diabetes compared with those without diabetes¹². Mental illnesses such as depression also lead to neuro-hormonal changes such as changes in Hypothalamic Pituitary Axis, altering glucose transport and immunological changes like increase in pro-inflammatory cytokines as an adaptive response to stress⁷. Such immune system activation also accompanies with medical illnesses like diabetes, cancer, cardiovascular disease⁶. Research has shown the increased risk of diabetes in patients with depression in all racial / ethnic groups⁸. A meta-analysis of 39 studies, reported that 11-12% of the prevalence of Major Depression in patients with Diabetes. This meta-analysis also showed that there was a two-fold increased prevalence of depression in patients with diabetes compared to controls⁹. A good number of studies showed a significant association between Depression and each of six complications of diabetes, namely Nephropathy, Neuropathy, Retinopathy, Vasculopathy, Coronary Artery Disease and Cerebro-Vascular Accidents.

MATERIALS AND METHODS

The study conducted in Department of Medicine, Osmania General Hospital, Hyderabad. The patients included previously screened by Physician/ Endocrinologist and diagnosed as having diabetes mellitus and taken as the sample. The patient population comprised of persons suffering from diabetes mellitus of all types and suffering from one or more complications of diabetes also. These patients were attending the medical as well as departments of Neurology, Nephrology, Ophthalmology and Endocrinology for the care and patients were selected on a consecutive sampling basis.

Based on the presence of complications due to diabetes, the patients divided into two groups:

Group A: Diabetes without complications

Group B: Diabetes with complications

Tools used:

1. Semi-structured proforma
2. ICD -10 Criteria for diagnosis of Depressive Episode
3. HAM-D Scale

INCLUSION CRITERIA:

1. Patients with Diabetes (as per International Criteria), with or without complications
2. Age group: 18-65 years

Criteria for the Diagnosis of Diabetes Mellitus

Symptoms of Diabetes plus Random Blood Glucose Concentration > 1.1 mmol/l (200 mg/dl)

Or

Fasting plasma glucose > 7.0 mmol/l (126 mg/dl)

Or

Two-hour plasma glucose > 11.1 mmol/l (200 mg/dl) during an Oral Glucose Tolerance Test.

- A. Random defined as without regard to time since the last meal.
- B. Fasting defined as no caloric intake for at least 8 hours.
- C. The test performed using a glucose load containing the equivalent of 75g.

Anhydrous Glucose dissolved in water; not recommended for routine clinical use.

Exclusion criteria:

1. Impaired Glucose Tolerance, impaired Fasting Glucose and Gestational Diabetes
2. Head injury
3. Epilepsy
4. Patients using Steroids, Immunoglobulins, Interferon.
5. Connective tissue disorders, other endocrinal disorders
6. Cancer patients
7. Intra Cranial Space Occupying Lesions
8. HIV patients
9. Patients with known Psychotic disorders
10. < 18 yrs and > 65 yrs
11. Mental Retardation

DESCRIPTIONS OF TOOLS USED

1. Semi structural Proforma

All the participants administered the semi-structured proforma, which elicits the demographic data like age, education, occupation, socio-economic status of the patient. A detailed history about the family type, living situations, number of children, substance use and dietary habits taken. A detailed evaluation of the significant family history for medical and mental illnesses, hospitalization status, treatment details regarding diabetes and complications of diabetes done. In the end, it includes the Clinical Examination and Mental Status Examination done for diagnosis of the Depressive episode using ICD -10 diagnostic criteria.

2. Hamilton Rating Scale for Depression

The Hamilton rating scale for depression (HAM-D24) is a multiple-choice questionnaire. It is a clinician applied scale. The strengths of the HAM-D24 include its excellent validation/research base, and ease of administration, the inter-rater reliability for the total score ranges from 0.87 to 0.95. The validity of the scale appears high.

Scoring:

Mild 20-30

Moderate 30-40

Severe 40 and above

OPERATIONAL PROCEDURE

The sample consisted of patients in the age group of 18-65 years belonging to both genders, of different regions. After obtaining informed written consent from all patients who were studied, detailed history of age, sex, socio-economic status, education, family type, living conditions, diabetes treatment and complications taken. The patients divided into two groups. Group A consisted of 40 number of

patients with diabetes and group B of 40 of those diabetic patients with complications. Each patient in both groups screened for depression by applying ICD-10 criteria and severity of depression is assessed by using Hamilton Rating Scale-24 for depression. It is a cross-sectional study and the time taken for the interview was 2-3 hours approximately and the interview conducted in a single session.

RESULTS AND DISCUSSION

The data was collected and subjected to statistical analysis using various methods and the results discussed below:

Table 1: Prevalence of Depression

In total sample 40%
In uncomplicated group 15%
Complicated group 72.5%

The prevalence rate of depression in the complicated group is higher than the uncomplicated group.

Table 2: Criteria for Depression

MOOD	Uncomplicated (n=40)	Complicated (n=40)	Chi-square	Significance
Yes	6(15%)	29(72.5%)	26.87	P=0.001 Significant
No				
DECREASED PLEASURABILITY				
Yes	6(15%)	30(75%)	34.095	P=0.001 Significant
No	34(85%)	8(20%)		
Not known	0(0%)	2(5%)		
FATIGUABILITY				
Yes	6(15%)		39.200	P=0.001 Significant
No	34(85%)			
DECREASED ATTENTION and CONCENTRATION				
Yes	9(22.5%)	29(72.5%)	20.050	p=0.001 Significant
No	31(77.5%)	11(27.5%)		
REDUCED SELF ESTEEM				
Yes	11(27.5%)	27(67.5%)	12.832	p=0.001 Significant
No	38(47.5%)	13(32.5%)		
IDEAS OF GUILT and WORTHLESSNESS				
Yes	2(5%)	26(65%)	36.091	p=0.001 Significant
No	38(95%)	12(30%)		
Not known	0(0%)	2(5%)		
PESSIMISTIC VIEWS ABOUT FUTURE				
Yes	39(97.5%)	33(82.5%)	52.379	p=0.001 Significant
No	1(2.5%)	7(17.5%)		
IDEAS OR ACTS OF SELF HARM and SUICIDE				
Yes	39(97.5%)	22(55.0%)	30.792	p=0.001 Significant
No	0(0%)	16(40%)		

Not known		2(5%)		
DISTURBED SLEEP				
Yes	24(60%)	30(75%)	14.361	P=0.001 Significant
No	16(40%)	8(20%)		
Not known	0(0%)	2(5%)		
Diminished appetite				
Yes	26(65%)	27(67.5%)	8.455	P=0.004 Significant
No	14(35%)	13(32.5%)		
ANHEDONIA				
Yes	34(87.2%)	27(67.5%)	22.747	P=0.001 Significant
No	6(15%)	13(32.5%)		
DECREASED EMOYIONAL REACTIVITY				
Yes	34(87.2%)	22(55%)	26.676	P=0.001 Significant
No	4(10.3%)	15(37.5%)		
Not known	1(2.5%)	3(7.5%)		
Early morning awakening 2hrs before				
Yes	38(97.4%)	24(60%)	30.115	P=0.001 Significant
No	1(2.6%)	16(40%)		
Depression worsening in morning				
Yes	38(97.4%)	23(57.5%)	28.177	P=0.001 Significant
No	1(2.6%)	17(42.5%)		
Psychomotor retardation				
Yes	39(97.4%)	23(57.5%)	28.177	P=0.001 Significant
No	1(2.6%)	17(42.5%)		
WITH DRAWN				
Yes	34(87.2%)	20(50%)	23.662	P=0.001 Significant
No	1(2.6%)	17(42.5%)		
Not known	1(2.6%)	4(10%)		
DECREASED LIBIDO				
Yes	33(84.6%)	21(52.5%)	35.669	P=0.001 Significant
No	5(2.8%)	8(20%)		
Not known	1(2.6%)	11(27.5%)		

The above table is showing ICD-10 criteria for depression of complicated cases versus uncomplicated cases.

The variable depressed mood in the complicated group is 72.5%, whereas 15% in uncomplicated group and Reduced pleasurable found to be 75% in complicated and 15% in uncomplicated group. Decreased attention and concentration was 72% in the complicated group and 22.5% in uncomplicated and Reduced self-esteem was 67.5% in the complicated group and 27.5% in uncomplicated group. Ideas of guilt and worthlessness were 65% in the complicated group and 5% in the uncomplicated group and Pessimistic views about the future were 82.5% in complicated and 2.5% in uncomplicated group. Ideas and acts of self-harm and suicide were 55% in the complicated and 2.5% in the

uncomplicated group and Disturbed sleep found in 75% in complicated and 40% in the uncomplicated group. Decreased appetite was 67.5% in the complicated group and 35% in uncomplicated group and Decreased emotional reactivity was 55% in complicated 2.6% in the uncomplicated group and Early morning awakening was 67% in the complicated group and 2.6% in the uncomplicated group. Depression worsened in the morning was 57.5% in complicated and 2.6% in the uncomplicated group and Psychomotor retardation was 57.5% in complicated and 2.6% in the uncomplicated group. Withdrawn were 50% in the complicated group and 2.6% in the uncomplicated group and Decreased libido was 52.5% in the complicated group and 2.6% in the uncomplicated group. All the symptom variables of

depression except decreased appetite had shown a p-value of 0.001 which was highly substantial, suggesting the considerable presence of depression and criteria for depression in complicated cases, when compared to uncomplicated cases. Co-relating with meta-analysis of 27

studies suggested that depression was significant with a variety of diabetes complications showing consistent association of Diabetes Mellitus complications and depression symptoms¹.

Table 3: HAMILTON DEPRESSION RATING SCALE

Group	Nil	Mild	Moderate	Severe	Chi-square	p value
Complicated (n=40)	16(40%)	14(35.0%)	5(12.5%)	5(12.5%)	30.622	0.001
Uncomplicated (n=40)	39(97.4%)	0(0%)	1(2.61%)	0(0%)		
Total	55(68.4%)	14(17.7%)	6(7.6%)	5(6.3%)		

The scoring of HAMD24 is less than 20 is nil, 20-30 Mild, 30-40 Moderate, and above 40 is Severe. With this scoring, the above table and the graph are depicting the severity of depression in both groups. In this study, depression found in 31.6% of patients, and 68.4% were devoid of depression. Among the depressive patients, 24 (60%) of complicated cases showing depression and the severity is mild in 14 (35%), moderate in 5 (12.5%) and severe in 5 (12.5%). In Contrast, only 1 (2.6%) of uncomplicated cases has shown moderate depression with a significant p-value of 0.001. 60% of complicated cases were having depression when compared to 2.6% of patients in uncomplicated cases. And depression was not found in 97.4% in uncomplicated and in 40% complicated group. Depression was significant with a variety of diabetes complications showing consistent association of Diabetes Mellitus complications and depression symptoms^{5,10}.

Table 4: HAMILTON DEPRESSION RATING SCALE - 24

Variables	Uncomplicated	Complicated (n=40)	Chi-square	p value
Depressed mood	0.23(0.485)	1.15(0.864)	5.813	0.001
Feeling of guilt	0.21(0.469)	1.38(1.030)	6.469	0.001
Suicide	0.23(0.583)	0.80(0.992)	3.098	0.003
Insomnia early	0.41(0.549)	1.13(0.853)	4.417	0.001
Insomnia middle	0.05(0.320)	0.85(0.802)	5.784	0.001
Insomnia late	0.08(0.354)	1.08(0.859)	6.720	0.001
Work and activity	0.21(0.57)	1.88(1.137)	8.221	0.001
Retardation	0.05(0.320)	1.15(1.027)	6.389	0.001
Gen. Somatic symptoms	0.36(0.537)	1.03 (0.733)	4.595	0.001
Genital symptoms	0.00(0.000)	0.98(0.733)	7.859	0.001
Hypochondriasis	0.26(0.595)	1.58(1.152)	6.367	0.001
Loss of weight	0.03(0.160)	0.75(0.840)	5.293	0.001
Agitation	0.03(0.160)	0.50(0.784)	3.745	0.001
Anxiety psychic	0.70(1.137)	0.70(1.137)	2.884	0.006
Anxiety somatic	0.23(0.485)	1.00(0.906)	4.689	0.001
Somatic GI	0.08(0.270)	0.75(0.670)	5.884	0.001
Insight	0.00(0.000)	0.15(0.533)	1.78	0.083
Diurnal variation	0.00(0.000)	1.00(0.847)	7.46	0.001
Depersonalization and Derealization	0.03(0.160)	0.00(0.000)	-1.0	0.324
Paranoid symptoms	0.03(0.160)	0.00(0.00)	1.0	0.324
OCD symptoms	0.00(0.000)	0.00(0.000)	-	-
Helplessness	0.33(0.701)	1.95(1.061)	8.010	0.001
Hopelessness	0.56(0.78)	1.93 (0.997)	6.277	0.001
Worthlessness	0.44(0.788)	1.50(0.716)	6.277	0.001
HDRS Total	3.95(7.518)	23.2(14.449)	7.40	0.001

The above table is displaying the individual variables of the HAMD-24 scale. The variables of depression with most of them showing statistical significance in the complicated group (p-value <0.001) than the uncomplicated group suggesting the increased prevalence of depression in the complicated group. Present study

emphasizes early recognition and intervention of depressive episode is associates with prospective outcomes in aholistic manner in long run. Psychotherapeutic interventions (some of which were combined with diabetes education) had a moderate-to-large effect on depressive symptoms and a moderate-to-large effect on glycemic

control¹⁵ Comorbid depression in patients with DM establishes a potentially life-threatening combination.¹³ Prospective studies have shown that depression is associated – besides the increased risk for diabetic complications – with increased risk for cardiovascular disease and all-cause mortality, even after controlling for potential mediators, such as health-related behaviours.¹⁸ The findings are similar to, The Pathways Study, A meta-analysis of studies suggested that depression was significant with a variety of diabetes complications showing consistent association of Diabetes Mellitus complications and depression symptoms.¹² In diabetic patients, depression remains underdiagnosed and an important aspect for the diabetic specialist would be the awareness of this quite common co-morbidity. A multidisciplinary approach of the diabetic patient would help improve the outcomes of disease.¹³ It is incumbent on healthcare professionals to identify depression in people with diabetes when present and then treat this rapidly and effectively in order to achieve the best clinical outcomes for these individuals. Most health services are poorly equipped to deal with comorbidity and, therefore, novel care pathways are needed to address this important public health problem¹⁴.

CONCLUSION

1. In this study, Depression is present in 40% of total no. Of patients, 60% were devoid of depression.
2. Prevalence of Depression was 15% in uncomplicated group, and 72.5% in complicated group suggesting depression was more associated with diabetes and its complications
3. Among the Depressive patients of the complicated group, 35% were suffering from mild depression. 12.55 of moderate and 12.5% with severe depression by applying the HAMD-24.
4. Only 2.64% of the uncomplicated group were having Depression of Moderate severity.
5. All the variables of depression in ICD-10 criteria except reduced appetite were significantly higher in the complicated group when compared to the uncomplicated group.
6. In this study, most of the patients were of Mild (35%) and Moderate (15.1%) Severity attributing to availability of specific interventions like treatment of diabetes and its complications at free of cost availability of functional social support.

Limitations

1. Patient selection made from one government hospital which may not reflect the entire community.
2. The subjects taking into the study were those who were receiving treatment provided by the state

government at free of cost, and those patients, receiving treatment at their expenses were not studied.

3. Diabetic patients who are not able to get treatment for complications were also not examined.
4. The sample size is small.
5. Though precautions are taken to minimize examiner bias, chances still present as rater and investigator are the same.

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