Depression in Type 2 Diabetes Mellitus Patients Attending a Tertiary Care Hospital in North Karnataka: A Hospital-Based Descriptive Study

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INTRODUCTION

It is widely recognized that depression is more common among people with diabetes than in the general population.1 The World Health Organization predicts that about 300 million people will be affected from diabetes by the year 2025. India has one of the largest diabetic populations and it is expected to grow to 69.9 million by the year 2025, also there is a steady increase in prevalence of type 2 diabetes mellitus India.2 Depression has been defined as a wide range of emotional lows, from mere sadness to a pathological suicidal state.3 Depression causes a large proportion of burden with non-fatal health outcomes and makes up about 12% of total years lived with disability.4 The prevalence of depression is common among the diabetics.5 Diabetics have a higher risk of having depression when compared to normal population.6 The prevalence of depression is more in the patients having long duration of diabetes and complications associated with it.7 The self-management of the patient and the adherence to antidiabetic treatment was poor in diabetics with depression.8 They are more likely to have higher cardiovascular risk factors such as smoking, obesity, sedentary lifestyle, and uncontrolled hyperglycemia.9 Depression may be an important barrier for the self-care and self-management of the diabetes. Macrovascular and microvascular are more in patients with diabetes and depression compare to those patients with diabetes alone.10

Many of the treating physicians fail to recognize the underlying depression of patients with diabetes mellitus.10

RESULTS: In the present study, 54.4% of the participants were found to be having depression, which ranged from mild to severe, most of the them had only mild symptoms. Most of the study participants, that is, about 22% belonged to the age group of 51–60 years followed by 18% in 41–50 years. In the present study, depression was found more in females (30.66%) than in males (24.66%). In this study, majority of the patients (33.3%) on OHA were not depressed, whereas 15.2% of patients on insulin and OHAs were depressed. A total of 48% of the patients with comorbidities were depressed in the present study. Conclusion: The diabetic patients are more prone to have depression, therefore, it is necessary for the well-being of diabetic patients that the patients are assessed for the presence or development of depression.

Key words: Beck's Depression Inventory, depression, diabetes
Only about one-third of people are appropriately treated for both diabetes mellitus and major depression. Treatment of both the disorders plays a key role in control, prevention, and treatment. Indian data on the prevalence of depression in diabetes limited. India, being a middle-income country, it has special relevance for and also India has high prevalence of both these disorders. Hence, the study has been undertaken.

**MATERIALS AND METHODS**

**Study Setting**

The present study is a hospital-based cross-sectional descriptive study. The study was undertaken in patients attending outpatient department of tertiary care hospital in Bagalkot. The study duration was for 2½ months (75 days) from August 10, 2019, to October 25, 2019.

**Inclusion Criteria**

Patients with established Type 2 diabetes mellitus for at least last 1 year who were on treatment were considered for the study.

**Exclusion Criteria**

Patients who did not give consent, non-respondents were excluded from the study. Patients with pre-existing psychiatric illness or those who are currently on anti-depressants, pregnant women, and seriously ill patients were excluded from the study.

The objectives of the study were explained to the study participants before initiating the study and the confidentiality of information was assured. A pre-designed and pre-tested questionnaire was used to elicit the information about sociodemographic factors.

**Consent**

Informed and written consent was obtained from all the study participants. The participants were explained about the study in their own language and interviewed after taking informed consent. Confidentiality was maintained at all times.

**Tools for Assessment of Depression**

The symptoms of depression were assessed by Beck Depression Inventory (BDI) scale. It is a mood measuring device originally developed by Dr. Aaron T Beck. It is one of the most widely used screening instruments for detecting symptoms of depression. This scale has been tested and validated.

It is a 21-item instrument to assess the existence and severity of symptoms of depression. Responses to the 21 items are made on a 4-point scale, ranging from 0 to 3 and the total score being 63. Each of the 21 items corresponding to a symptom of depression was summed to give a single score for the BDI scale. A score of 0–13 is considered as normal, 14–19 border line clinical depression or mild depression, 20–28 moderate depression, and 29–63 as severe depression.

**Sample Size**

The sample size was estimated using the formula $n = \frac{4pq}{L^2}$. The prevalence of depression, “$p$” among type 2 diabetes mellitus patients is taken as 41% which is reported by the previous study and taking the confidence interval as 95% with relative precision of 20%. By applying these values in the formula, the sample size is calculated as 145. It was rounded off to 150.

**Statistical Analysis**

Data were entered into Excel spread sheet. Data were expressed in terms of proportion or percentages. The association of each of the variables with depression was assessed using Fisher’s exact and Chi-square test. Variables showing statistical significant association with the outcome variable ($P < 0.005$) were considered as potential determining factors.

**RESULTS**

In the present study, the total participants were 150, females comprised 53% and 47% were male participants. About 44.6% of the participants scored had normal BDI score, 26.6% had mild score, 18.6% had severe score, and 10% of the participants had severe depressive BDI score [Table 1].

Most of the study participants, that is, about 22% belonged to the age group of 51–60 years followed by 18% in 41–50 years which was followed by the 30–40 years and least was 30–40 years. Maximum score of BDI was seen in the age group of 61–70 years, followed by 51–60 years, whereas the least was scored in 30–40 years and 41–50 years’ age group [Table 1]. The association was not statistically significant with Chi-square value of 12.78 and $P = 0.385$.

In the present study, 12% of the patients were on insulin only, 21.3% were on the insulin and oral hypoglycemic drugs, 66.4% had only oral hypoglycemic drugs. About 33.3% of the patients on oral hypoglycemic drugs were normal whereas 5.3% and 6% of the patients on insulin and insulin and OHD were normal. About 2.6% and 1.3% of the patients were severely depressed in the insulin and insulin and OHD group [Table 1]. The association was not statistically significant with Chi-square value of 6.041 and $P = 0.418$.

In the present study, 17.3% of the patients that scored normal score on BDI had a history of diabetes of <5 years, 11.3%
of the moderate depressive score had a history for 6–10 years followed by 10.7% of the patients with 10–15 years. About 6.6% of the patients with a history of more diabetes than 10 years had severe depressive score according to BDI. This association was statistically significant with Chi-square value of 32.9 and $P < 0.001$.

About 55.3% of the patients with comorbidities had either, mild, moderate, or severe depressive score on BDI, whereas the patients without comorbidities 21.3% scored normal values on BDI score [Table 2]. A total of 8.6% of the patients with depression did not have comorbid conditions and 23.3% of patients with comorbidities did not have depressive symptoms [Table 2]. This association was statistically significant with Chi-square 16.69 with $P < 0.001$.

### DISCUSSION

In the present study, 54.4% of the participants were found to be having depression, which ranged from mild to severe, most of the them had only mild symptoms. In a study by Guruprasad et al.,[15] it was 27.6%. Most of the study participants, that is, about 22% belonged to the age group of 51–60 years followed by 18% in 41–50 years which was followed by the 30–40 years and least was 30–40 years. Maximum score of BDI was seen in the age group of 61–70 years, followed by 51–60 years, whereas the least was scored in 30–40 years and 41–50 years’ age group.

In a study done by in a Ranjan Das et al.,[16] about 46.15% met criteria for depression, among the depressed group, 32.2% were mildly depressed, 36.7% were moderately depressed,
14.4% had severe depression, and 16.7% had very severe depression. In a study done by Thour et al., the prevalence of depression was 41%. Severe depression was present in 4% of subjects, moderate depression in 10% of subjects, and mild depression was present in 27% of subjects. This was in agreement with our study.

In the present study, depression was found more in females (30.66%) than in males (24.66%). In a study by Guruprasad et al., the predominance of depression was more among females. The prevalence of depression is more in women compared to men both in general population and in diabetes, both globally and in India according to the previous studies. Asghar et al. found evidence of depressive symptoms in 29% of males and 30.5% of females with newly diagnosed diabetes in rural Bangladesh. According to Subramani et al., the prevalence of depression among females was 16.3% and males was 13.9%. According to Katon et al., female diabetic patients were associated with a significantly higher likelihood of meeting criteria for major depression. According to Tattersall et al., diabetes can have considerable consequences on the quality of everyday life, with possible limitations in physical activity social life, family relations, and leisure activities.

In this study, majority of the patients (33.3%) on OHA were not depressed, whereas 15.2% of patients on insulin and OHAs were depressed. According to a study by Al-Amer et al., the patients who were on insulin treatment had a significant association with depression. According to Katon et al., independent factors that were associated with a significantly higher likelihood of meeting criteria for major depression included treatment with insulin. Similar results were obtained in a study by Kessler et al. This may be due to repeated painful injections and its interference in everyday life. Diabetes find it difficult to use insulin when they are traveling or when they are working. This could have contributed to the depression. A total of 48% of the patients with comorbidities were depressed in the present study. According to the study by Guru Prasad et al., it was 25.9%. According to Katon et al., the presence of comorbidities had significant likely hood of depression. Anderson et al. found that the prevalence of comorbid depression was 20% in community-based study it is much less compared to our study. Wane et al. found out that the course of depression in patients with diabetes and other comorbid conditions is chronic and severe. This may be due to the multiple drug intake and frequent visits to health facilities. The quality of life is decreased due to comorbidities.

CONCLUSION

The diabetic patients are more prone to have depression, therefore, it is necessary for the well-being of diabetic patients that the patients are assessed for the presence or development of depression. The treating physician and the mental health professionals integrated approach need to be developed. Adequate counseling of the diabetes mellitus patients may help in prevention of the depression and associated comorbid conditions.

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