Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

PREVELENCE OF DEPRESSION AMONG TYPE II DIABETES PATINETS IN AMEDICAL COLLEGE HOSPITAL IN JHARKHAND: A PROSPECTIVE COHORT STUDY.

Anil Kumar[a], Chhitiz Anand[b], Rajiv Kumar Mahli[c]*
[a]Assistant Professor, Department of Medicine, SBMC, Hazaribagh, Jharkhand, India
[b]Assistant Professor, Department of Paediatrics, SBMC, Hazaribagh, Jharkhand, India
[c]Assistant Professor, Department of Biochemistry, SBMC, Hazaribagh, Jharkhand, India

ABSTRACT

Background

Diabetes and depression are both very serious chronic conditions that decrease the quality of life, increase functional disability, and decrease life expectancy. Though this association is well established, results from developing countries like India and especially eastern India, where poor socio-economic status, lower literacy, and patient compliance a major factors hindering treatment are limited. The study aimed to investigate the prevalence of depression among type 2 diabetes patients in the center.

Method

This prospective study involved ninety-nine previously diagnosed Type II diabetes patients aged 30 years and above between July 2021 and 30th September 2021 were interviewed. Patients with known psychiatric disorders treatment were excluded from the study. Patient Health Questionnaire (PHQ)-9 questionnaires were used to screen for depression.

Result

Our cohort comprised 99 patients with a median age of 55years (Range: 19-82years) with a Male: Female of 1.06:1. The study found an incidence of 70% of varying grades of depression among type 2 diabetes patients, with 40% having mild and 54% moderate depression. None of the patients had severe depression. No statistically significant association between the incidence of depression among various age and gender groups was found. Longer illness duration correlated significantly with higher depression grades ($p=0.005$), while age, gender, socio-economic status, regular follow-ups, diabetes-hypertension coexistence, and diabetes-related complications showed no significant impact on depression rates ($p>0.05$). There was no notable correlation observed between the occurrence of depression and factors such as socioeconomic status, regular follow-up, the coexistence of hypertension, or the presence of other complications related to diabetes.

Conclusion

Depression is a significant problem among diabetic patients. Timely recognition and referral for thorough assessment and treatment can significantly enhance the quality of life for these patients and reduce the burden of care required.

Recommendation

Early identification and referral for management of depression among diabetic patients can significantly improve their quality of life and reduce the burden of care, especially in settings with limited resources and poor patient compliance.

Keywords: Diabetes, Depression, Prevalence, Quality Of Life
Submitted: 2024-03-26 Accepted: 2024-03-28

Corresponding Author:
Rajiv Kumar Mahli
Assistant Professor, Department of Biochemistry, SBMC, Hazaribagh, Jharkhand, India
Email: dr_rkmahli@yahoo.in

BACKGROUND

The association between Diabetes and Depression has been recognized since the 17th century, but the complexity of their relationship was only studied in the 20th century. The incidence of depression among diabetic patients varies across different ethnicities, with a higher incidence among African Americans than Northern European descendants (1) (2). Diabetes and depression are both very serious chronic conditions that decrease the quality of life, increase functional disability, and decrease life expectancy (3) (4). The physical, mental, and social well-being, and co-morbid depression among diabetic patients contribute to poor self-care and adherence to medical treatment. This, in turn, diminishes the quality of life and increases rates of medical morbidity and mortality, and the incurred medical-care costs (5)

Though this association is well established, results from developing countries like India and especially eastern India, where poor socio-economic status, lower literacy, and patient compliance a major factors hindering treatment are limited. The study aimed to assess depression prevalence among Type II diabetes patients in Eastern India, considering socio-economic factors, compliance, co-morbidities, illness duration, gender, and age. It sought insights for early identification and management, enhancing diabetic patients' quality of life.

MATERIAL & METHOD

Study design

A prospective study was conducted.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

Study setting

The study was carried out at a Medical College Hospital in Jharkhand, India, between 1st July 2021 and 30th September 2021.

Participants

Ninety-nine previously diagnosed Type II diabetes patients aged 30 years and above, visiting the Internal Medicine Out-patient Department were interviewed. Patients with known psychiatric disorders on treatment were excluded from the study.

Inclusion and exclusion criteria

The inclusion criteria for the study included Type II diabetes patients aged 30 years and above who were previously diagnosed. Patients with known psychiatric disorders on treatment were excluded from the study to focus specifically on depression among Type II diabetes patients without pre-existing psychiatric conditions.

Sample size

To calculate the sample size for this study, the following formula was used for estimating a proportion of a population:

$$n = \frac{Z2 \times p \times (1-p)}{E2}$$

Where:
- n = sample size
- Z = Z-score corresponding to the desired level of confidence
- p = estimated proportion in the population
- E = margin of error

Bias: There was a chance that bias would arise when the study first started, but it was avoided by giving all participants identical information and hiding the group allocation from the nurses who collected the data.

Data collection and procedure

Patients were given the Patient Health Questionnaire (PHQ)-9, in the language of their preference (English/ Hindi). It was self-administered by the patients and the primary investigator scanned the completed questionnaire, verifying positive responses, and applied diagnostic algorithms as abbreviated at the bottom of the page.

Major depression was diagnosed if 5 or more of the 9 depressive symptom criteria have been present at least "more than half the days" in the past 2 weeks, and 1 of the symptoms is depressed mood or anhedonia. Other depression is diagnosed if 2, 3, or 4 depressive symptoms have been present at least "more than half the days" in the past 2 weeks, and 1 of the symptoms is depressed mood or anhedonia. One of the 9 symptom criteria ("thoughts that you would be better off dead or of hurting yourself in some way") counts if present at all, regardless of duration.

The PHQ-9 questionnaire assesses depression based on responses to nine items, with scores ranging from 0 to 27, and interpretations categorized into minimal, mild, moderate, moderately severe, and severe depression, with each of the 9 items being scored from 0 (not at all) to 3 (nearly every day). An item was also added to the end of the diagnostic portion of the PHQ-9 asking patients who checked off any problems on the questionnaire: "How *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?" Patients were divided into 5 groups based on the PHQ-9 score; 0-4 as non-minimal,5-9 as mild, 10- 14 as moderate, 15-19 as moderately severe, and 20-27 as severe (6).

This is an observational study and intervention was not a part of the study. As the study was conducted in a resource-constrained setup, the investigation available with the patient was used for analysis. Patients with scores between 5 and 9 were re-evaluated after 2 weeks.

Statistical analysis

Statistical analysis was conducted with IBM-SPSS version 21.0. $p < 0.05$ was taken to be significant.

Ethical considerations

The study protocol was approved by the Ethics Committee and written informed consent was received from all the participants.

RESULT

Out of the initial 104 participants, 5 were deemed ineligible during screening due to incomplete medical records. After examining eligibility, 3 more were excluded due to a history of psychiatric disorders. However, 2 individuals declined to participate, citing time constraints, leaving 99 potentially eligible individuals.

During the study, 99 patients were interviewed, and analyzed results of the PHQ-9 questionnaire with a median age of 55 years (Range: 19-82 years). The cohort comprised 48 females and 51 males with a Male: Female of 1.06:1.

On analysis of the PHQ-9 score, 70.7% (70/99) reported varying grades of depression. Amongst those diagnosed with depression (PHQ-9 (score >5), 40% (28/70) had mild depression, 54% (38/70) had moderate depression and 6% (4/70) had moderately severe depression. None of the patients from the cohort had severe depression.

The cohort was divided into 5 groups based on the 5 PHQ-9 scores and data was compared amongst them. There was no statistically significant difference in age (p=0.227) and gender (p=0.821)between the groups.

The duration of illness of the cohort varied from 2 months to 10 years with a mean of 1.8 years. There was a statistically

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

significant difference among various groups with the duration of illness (p= 0.005). Patients with longer duration of illness had higher grades of depression.

While comparing the socio-economic background of the patients, 51% of the cohort belonged to lower socio-economic strata, however, there was no significant difference (p=0.111) in the incidence of depression between patients from different socio-economic groups.

Regular 3-month follow-ups were advised for the cohort, but 78% of the cohort did not have routine follow-ups, however, there was no statistically significant difference among those with and without regular check-ups (p=0.80).

The association between diabetes and hypertension is well known. 44% of the cohort had co-existence of diabetes and hypertension. When comparing the incidence of depression, There was also no statistically significant correlation between the incidence of hypertension and the occurrence of depression (p=0.199).

Diabetes is also implicated in causing various micro and macrovascular complications and the incidence increases with the increasing duration of illness. The incidence of various complications attributable to diabetes was 17%, however, there was also no significant difference in the incidence of depression amongst those with and without complications secondary to diabetes (p=0.08).

TABLE 1: Various factors and their impact on incidence of depression

Sl. No	Factors	P value of their impacton incidence of depression
1	Age	0.227
2	Gender	0.821
3	Socio-economic status	0.111

TABLE 2: Clinical characteristics

Sl. No	Factors	P value of their impacton incidence of depression
1	Duration of Diabetes	0.005
2	Regular 3 monthly follow-up	0.80
3	Co-relation of diabetes with hypertension	0.199
4	Diabetes related complication	0.08

DISCUSSION

The study found an incidence of 70% of varying grades of depression among type 2 diabetes patients, with 40% having mild and 54% moderated depression. None of the patients had severe depression. No statistically significant association between incidents of depression among various age and gender groups was found. A significant association was noted for the incidence with duration of illness. No significant association between the incidence of depression and socio-economic status, regular follow-up, co-existing hypertension, and co-existence of other diabetes-related complications was noted.

A systematic review conducted in 2012, noted almost double the incidence of depression among type 2 diabetes patients than those without diabetes [19.15% (6.3-33%) v/s 10.7% (3.8-19.4%)] (7). Various epidemiological evidence suggests that at least one-third of people with diabetes suffer from depressive disorders (8).

Across studies, various scales have been used to screen for depression. Lin et al. in 2009 studied the PHQ-9 score of 4148 patients and noted that those with Type 2 diabetes and coexisting depression face substantially increased mortality risks. Single women, younger age, longer duration of diabetes, less-healthful habits, worse glycemic control, and more medical comorbidities were implicated among those with depression and diabetes. He noted that major depression was significantly associated with all-cause mortality and non-cardiovascular, non-Cancer cancer mortality. Minor depression on the other hand showed a non-significant association with any mortality outcome (9).

Depression among Indian people with diabetes within urban clinical populations is estimated at approximately 41% (10). Severe depression (PHQ score ≥15) was present in 4% of subjects, moderate depression in 10% of subjects, and mild depression in 27% of subjects(11). Another study from Eastern India noted an even higher prevalence of depression among diabetics with 54.6% (12).

Although most studies are cross-sectional, evidence suggests that there are a range of factors that may be associated with the risk of developing depression. The presence of female gender, younger and/or older age, individuals living alone, those with poor social support, and people with low socioeconomic status increases the incidence of depression in the general population. Similar factors have also been found to increase the risk of depression in people with diabetes. In addition, the occurrence of late or acute complications, persistent poor glycemic control, and insulin therapy in T2DM increase the risk for depression in people with diabetes (13) (14). Diabetes-specific risk factors for depression like co-morbidity of diabetes-related complications
and in particular vascular complications have been seen to significantly increase the risk for depression, no such association was noted in the study (15).

Other Indian studies also did not show any sex predilection for the prevalence of diabetes similar to the studies (16). Siddiqui et al. noted no significant association between depression and duration of illness, unlike the study where higher prevalence was noted with those with longer duration of illness (17).

Similar to the study, few other Indian studies also did not find any significant association of depression with age, sex, microvascular complications, and hypertension (11), while few noted female gender, increasing age, rural residence, low literacy, longer duration of illness, and overweight/obesity were significantly associated with high frequency of depression (12).

The prevalence of depression among type 2 diabetic patients was 70%, which was higher than most studies published to date. No significant association was found among various factors, which in various other studies have contributed to the occurrence of depression. This can be attributable to the small sample size of the population. This study served as a ground to establish the prevalence of depression among diabetics in this geographical belt. Routine screening for the same is recommended and can serve to improve the morbidity and mortality in this cohort.

Generalizability: While the study provides valuable insights into the specific population and context in which it was conducted, caution should be exercised when extrapolating the findings to broader populations or different settings. Replication of the study in diverse populations and settings would strengthen the external validity of the results.

CONCLUSION

Depression is a significant problem among diabetic patients. The incidence and prevalence of depression in this cohort are less studied in resource constraint settings like ours. Early identification and referral for further evaluation and management can remarkably improve the quality of life of such patients and decrease the care given burden. Routine screening for depression among diabetes patients should be undertaken.

LIMITATIONS

The limitations of this study include a small sample population who were included in this study. Furthermore, the lack of a comparison group also poses a limitation for this study's findings.

RECOMMENDATION

Early identification and referral for management of depression among diabetic patients can significantly improve their quality of life and reduce the burden of care, especially in settings with limited resources and poor patient compliance.

ACKNOWLEDGMENT

We are thankful to the patients; without them, the study could not have been done. We are thankful to the supporting staff of our hospital who were involved in the patient care of the study group.

LIST OF ABBREVIATIONS

PHQ-9 - Patient Health Questionnaire-9
T2DM - Type 2 diabetes mellitus
SD - Standard Deviation

SOURCE OF FUNDING

No funding received.

CONFLICT OF INTEREST

The authors have no competing interests to declare.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

REFERENCES

1. Gary TL, Crum RM, Cooper-Patrick L, Ford D, Brancati FL. Depressive symptoms and metabolic control in African-Americans with type 2 diabetes. Diabetes Care [Internet]. 2000 Jan 1;23(1):23. Available from: http://care.diabetesjournals.org/content/23/1/23.abstract
2. Thomas J, Jones G, Scarinci I, Brantley P. A Descriptive and Comparative Study of the Prevalence of Depressive and Anxiety Disorders in Low-Income Adults With Type 2 Diabetes and Other Chronic Illnesses. Diabetes Care [Internet]. 2003 Aug 1;26(8):2311. Available from: http://care.diabetesjournals.org/content/26/8/2311.abstract
3. Collins MM, Corcoran P, Perry IJ. Anxiety and depression symptoms in patients with diabetes. Diabetic Medicine [Internet]. 2009 Feb 1 [cited 2022 Jan 24];26(2):153–61. Available from: https://doi.org/10.1111/j.1464-5491.2008.02648.x
4. Goetzel RZ, Hawkins K, Ozminkowski RJ, Wang S. The Health and Productivity Cost Burden of the "Top 10" Physical and Mental Health Conditions Affecting Six Large U.S. Employers in 1999: Journal of Occupational and Environmental Medicine [Internet]. 2003 Jan [cited 2022 Jan 24];45(1):5–14. Available from: http://journals.lww.com/00043764-200301000-00007
5. Egede LE, Nietert PJ, Zheng D. Depression and All-Cause and Coronary Heart Disease Mortality Among Adults With and Without Diabetes. Diabetes Care [Internet]. 2005 Jun 1[cited 2022 Jan 24];28(6):1339–45. Available from: https://doi.org/10.2337/diacare.28.6.1339
6. Kroenke K, Spitzer RL, Williams JB. The PHQ-9: validity of a brief depression severity measure. J Gen Intern Med [Internet]. 2001 Sep;16(9):606–13. Available from: https://pubmed.ncbi.nlm.nih.gov/11556941
7. Roy T, Lloyd CE. Epidemiology of depression and diabetes: A systematic review. Journal of Affective Disorders [Internet]. 2012 Oct 1;142:S8–21. Available from: https://www.sciencedirect.com/science/article/pii/S0165032712700046
8. Anderson RJ, Freedland KE, Clouse RE, Lustman PJ. The Prevalence of Comorbid Depression in Adults With Diabetes. Diabetes Care [Internet]. 2001 Jun 1 [cited 2022 Jan 24];24(6):1069–78. Available from: https://diabetesjournals.org/care/article/24/6/1069/22483/The-Prevalence-of-Comorbid-Depression-in-Adults
9. Lin EHB, Heckbert SR, Rutter CM, Katon WJ, Ciechanowski P, Ludman EJ, et al. Depression and Increased Mortality in Diabetes: Unexpected Causes of Death. Ann Fam Med [Internet]. 2009 Sep 1;7(5):414. Available from: http://www.annfammed.org/content/7/5/414.abstract
10. Mendenhall E, Narayanan G, Prabhakaran D. Depression and diabetes in India: perspectives and recommendations. Diabet Med [Internet]. 2012 Sep;29(9):e308–11. Available from: https://pubmed.ncbi.nlm.nih.gov/22587494
11. Thour A, Das S, Sehrawat T, Gupta Y. Depression among patients with diabetes mellitus inNorth India evaluated using patient health questionnaire-9. Indian J Endocrinol Metab [Internet]. 2015;19(2):252–5. Available from: https://pubmed.ncbi.nlm.nih.gov/25729687
12. Tewari A, Som TK, Kumar R, Basu D, Ghose G, Chakraborty SN, et al. Depression anddiabetes: A tendency or demon of darkness among diabetics? A cross-sectional study among type 2 diabetes mellitus patients attending an "integrated diabetes and gestational diabetes clinic" of Eastern India. International Journal of Medical Science and Public Health. 2019;8(11):7.
13. Brown LC, Majumdar SR, Newman SC, Johnson JA. Type 2 diabetes does not increase risk of depression. CMAJ [Internet]. 2006 Jul 4;175(1):42–6. Available from: https://pubmed.ncbi.nlm.nih.gov/16818907
14. Knol MJ, Twisk JWR, Beekman ATF, Heine RJ, Snoek FJ, Pouwer F. Depression as a riskfactor for the onset of type 2 diabetes mellitus. A meta-analysis. Diabetologia [Internet]. 2006 Mar 7;49(5):837. Available from: https://doi.org/10.1007/s00125-006-0159-x
15. Engum A. The role of depression and anxiety in onset of diabetes in a large population- based study. Journal of Psychosomatic Research [Internet]. 2007 Jan 1;62(1):31–8. Available from: https://www.sciencedirect.com/science/article/pii/S002239990600331X
16. Raval A, Dhanaraj E, Bhansali A, Grover S, Tiwari P. Prevalence & determinants of depression in type 2 diabetes patients. INDIAN J MED RES. 2010;7.
17. Siddiqui S, Jha S, Waghdhare S, Agarwal NB, Singh K. Prevalence of depression in patients with type 2 diabetes attending an outpatient clinic in India. Postgrad Med J [Internet]. 2014 Oct 1;90(1068):552. Available from: http://pmj.bmj.com/content/90/1068/552.abstract.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

PUBLISHER DETAILS

SJC PUBLISHERS COMPANY LIMITED

Category: Non-Government & Non-profit Organisation
Contact: +256775434261(WhatsApp)
Email: admin@sjpublisher.org, info@sjpublisher.org or studentsjournal2020@gmail.com
Website: https://sjpublisher.org
Location: Wisdom Centre Annex, P.O. BOX. 113407 Wakiso, Uganda, East Africa.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol. 5 No. 3 (2024): March 2024 Issue
https://doi.org/10.51168/sjhrafrica.v5i3.1120
Original Article

SJC PUBLISHERS COMPANY LIMITED

Category: Non-Government & Non-profit Organisation
Contact: +256775434261(WhatsApp)
Email: admin@sjpublisher.org, info@sjpublisher.org or studentsjournal2020@gmail.com
Website: https://sjpublisher.org
Location: Wisdom Centre Annex, P.O. BOX. 113407 Wakiso, Uganda, East Africa.