ANXIETY STATUS OF ADMITTED PATIENTS WITH TYPE 2 DIABETES MELLITUS

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ABSTRACT

Objective: The aim of this study was to ascertain the frequency of anxiety and its associated factors in patients with type 2 diabetes mellitus (Type 2 DM) who are hospitalized.

Methods: This cross-sectional study was performed at the department of Endocrinology, MTI-Hayatabad Medical Complex, Peshawar from 1st July 2023 to 31st December 2023. The study comprised of admitted patients of either gender with type 2 DM who were at least 18 years of age. The anxiety status of the patients was assessed by utilizing the Beck Anxiety Inventory (BAI).

Results: The study comprised of 256 inpatients with type 2 DM, of whom there 122 (47.7%) males and 134 (52.3%) females. The study subject's mean age was 55.6 ± 9.1 years. The mean duration of DM and mean HbA1c was 9.6 ± 4.5 years and 12.2 ± 2.1 %, respectively. The BAI mean score was 18.46 ± 10.6, with a lowest score of 1 and a maximum score of 47 (Range= 46). Approximately, 74.2% of the study participants had low anxiety, 16.4% had moderate anxiety while 9.4% had potentially concerning level of anxiety. The association of the anxiety status with the duration of DM (<0.001), complications of DM (<0.001) and comorbidities (0.002) was statistically significant.

Conclusion: Majority of the admitted patients with type 2 DM experienced some level of anxiety. It is imperative to identify and treat anxiety in individuals with type 2 DM to enhance their general quality of life.

Keywords: Type 2 DM, Anxiety, Beck Anxiety Inventory

INTRODUCTION

Diabetes Mellitus (DM) is currently being reckoned as a worldwide health emergency, with lower- and middle-income countries seeing a faster increase in its occurrence.[1] The International Diabetes Federation (IDF) in its data has shown that the prevalence of DM worldwide was 10.5% in 2021 and is predicted to increase to 12.2% in 2045.[2] DM is a diverse illness that can cause significant emotional impact in addition to severe morbidity and mortality resulting from micro and macrovascular complications.[3] As per World Health Organization (WHO), depression is the primary cause of disability worldwide, with 300 million people dying from this disabling mental illness.

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According to epidemiological research, the frequency of having depression and DM together is twice that of having either condition alone.[4] Anxiety or depressive disorders can potentially double in frequency in people with diabetes.[3]

The American Diabetes Association (ADA) advises clinical screening of diabetic patients for psychological distress, specifically anxiety and depression. Anxiety is as prevalent in this patient population as depression is, with a 20% greater prevalence in contrast to the broader population.[5] Patients with diabetes may develop anxiety problems for a variety of reasons, like physical ailments, family history, traumatic life situations, personal history, and drug abuse.[3] On other hand, it has been demonstrated that people with diabetes who also experience anxiety are more likely to experience complications of DM, dysregulated blood sugar, poor treatment compliance, poor self-care ability and greater morbidity and mortality. This eventually leads to poor quality of life.[6] Furthermore, comorbid depression along with DM may result in increased healthcare expenses.[7] A study in Pakistan reported the incidence of anxiety in hospitalized patients of type 2 DM population to be 50.7%.[4] Studies conducted in China and India have reported the prevalence of anxiety in this patient population to be 43.6% and 49.7%, respectively.[8,9]

Understanding the prevalence of anxiety and associated variables in the type 2 DM inpatient population is crucial to facilitate early identification of individuals who are at an enhanced risk of developing anxiety and also to allocate psychological intervention resources by the healthcare providers. Numerous studies have investigated the anxiety status in outpatient diabetic patients, however very few studies have explored the anxiety status and the associated factors in admitted population of type 2 DM. Thus, the goals of this research were to ascertain the frequency of anxiety and its accompanying factors among hospitalized type 2 DM patients.

MATERIAL AND METHODS

This cross-sectional observational study was carried out at the department of Endocrinology, MTI-Hayatabad Medical Complex, Peshawar from 1st July 2023 to 31st December 2023 following acceptance of approval (approval number 1252/ dated: 05/04/2023) from the hospital's ethical committee. Patients were recruited by employing nonprobability consecutive sampling technique. With a confidence interval of 95%, a margin of error of 5%, and a prevalence of anxiety of 21.1% in Pakistan[10], the openepi program[11] computed a sample size of 256.

Patients of either gender with type 2 DM who were at least eighteen years old and who were admitted for diabetes related complications like hyperosmotic hyperglycemic state (HHS), diabetic ketoacidosis (DKA), diabetic foot ulcers or infections, urinary tract infections (UTI), stable diabetic kidney disease, and suboptimal glycemic control participated. Patients with type 1 DM, gestational DM, type 2 DM patients who were in coma, had dementia, cerebrovascular accident, hypertensive encephalopathy, end stage kidney disease and those who declined to take part in the research were not included. Every participant provided written consent after being fully informed.

Demographic information like age, sex, occupation, degree of education, socioeconomic standing, duration of DM, comorbidities and complications of DM, and treatment of DM was gathered. The subjects' anxiety status was evaluated using the Beck Anxiety Inventory (BAI).[12] The BAI comprises of 21 symptoms of anxiety and patients are enquired of how much each of the symptom has affected them in the past week. Every participant was given a scale to rate the symptoms on, with 0 being “not at all” and 3 representing “severely, I could scarcely take it”. The overall score is expressed as a maximum of 63 and a minimum of 0. The sum of the 21 items was used to determine the final score. Potentially concerning levels of anxiety (score of ≥.36), moderate anxiety (score of 22–35), and low level of anxiety (score of 0–21) were the three categories for the overall anxiety score. The BAI has been found to have a high (0.75) test-retest reliability over one week and a high internal consistency (Cronbachs α = .92).[12]

SPSS version 20 was used for the analysis. While the biochemical measurements were presented as mean with standard deviation, the clinical features were expressed as frequency and percentages. The chi square test was used to determine how the various anxiety status categories related to the varied clinical and demographic features of the research population. The study employed regression analysis to examine the variations among the groups.

RESULTS

The study included 256 inpatients with type 2 DM, of which 122 (47.7%) were male and 134 (52.3%) were female. The study population's mean age was 55.6 ± 9.1 years. The mean HbA1c was 12.2 ± 2.1%, and the average duration of DM was 9.6 ± 4.5 years. Over half of the participants in the study were uneducated (85.5%) and unemployed (54.7%), with most of them belonging to either low (52%) or middle (47.3%) socioeconomic class. Most (79.7%) of the participants had an HbA1c level of >10%. Only 2.7% of the population had an HbA1c level of 6.5 to 8%. Approximately 63.7% of the patients had diabetic retinopathy while neuropathy and nephropathy were found in 23.4% and 0.8% of the patients respectively.

The BAI mean score was 18.46 ± 10.6, with a lowest score of 1 and a heighest score of 47 (Range= 46). Approximately, 74.2% of the study participants had a low anxiety, 16.4% had moderate anxiety while 9.4% had potentially concerning level of anxiety. Table 1 displays the baseline clinical and demographic parameters of the study cohort.

The association of the anxiety status of the study population with different patient characteristics was also assessed. It was evident that compared to males, females were more likely to have moderate and potentially concerning levels of anxiety. Similarly, patients who were uneducated, unemployed and who had poor glycemic control were more likely to have higher grades of anxiety. However, these results were statistically non-significant. It was

noticed that the association of the anxiety status with the duration of DM (<0.001), complications of DM (<0.001) and comorbidities (0.002) was found to be statistically significant. The association of anxiety status of type 2 DM patients with various demographic and clinical characteristics of the study population is presented in table 2.

Logistic regression analysis was performed to ascertain the likelihood of anxiety in various patient characteristics. It was found that diabetes duration of ≥ 5 years was associated with 0.29 odds of anxiety occurrence (p=0.004). Remaining variables like comorbidities, complications and HbA1c were not found to be statistically significant. These findings are presented in Table 3.

Table 1: Baseline demographic and clinical characteristics of the Study Population

Patient Characteristic		**Number of participants (n)**	**Percentage (%)**
Gender	Male	122	47.7
	Female	134	52.3
Education	Uneducated	219	85.5
	Educated	37	14.5
Employment	Unemployed	140	54.7
	Employed	116	45.3
Socioeconomic Status	Low	133	52.0
	Middle	121	47.3
	High	2	0.8
Duration of DM	< 5 years	40	15.6
	6 - 10 years	89	34.8
	> 10 years	127	49.6
Family History	No	167	65.2
	Yes	89	34.8
Comorbidities	No	130	50.8
	Yes	126	49.2
Complications	No	31	12.1
	Neuropathy	60	23.4
	Nephropathy	2	0.8
	Retinopathy	163	63.7
HbA1c	6.5 - 8%	7	2.7
	9 - 10 %	45	17.6
	> 10 %	204	79.7
Anxiety	Low Anxiety	190	74.2
	Moderate Anxiety	42	16.4
	Potentially concerning Anxiety	24	9.4

Table 2: Association of Anxiety Status of Type 2 DM patients with demographic and clinical characteristics of the study population.

Patient Characteristics		Anxiety Status			Total (n=256)	p value
		Low (n=190)	Moderate (n=42)	Potentially Concerning (n=24)		
Gender	Male	98	15	9	122	0.1
	Female	92	27	15	134	
Education	Uneducated	164	36	19	219	0.6
	Educated	26	6	5	37	
Employment	Unemployed	98	27	15	140	0.2
	Employed	92	15	9	116	
Socioeconomic status	Low	99	22	12	133	0.9
	Middle	89	20	12	121	
	High	2	0	0	2	
Duration of DM	< 5 years	17	11	12	40	<0.001
	6 - 10 years	63	17	9	89	
	>10 years	110	14	3	127	
Family history	No	127	25	15	167	0.6
	Yes	63	17	9	89	
Comorbidities	No	85	26	19	130	0.002
	Yes	105	16	5	126	
Complications	No	13	10	8	31	<0.001
	Neuropathy	42	10	8	60	
	Nephropathy	1	0	1	2	
	Retinopathy	134	22	7	163	
HbA1c (%)	6.5 to 8	6	1	0	7	0.2
	9 to 10	31	12	2	45	
	More than 10	153	29	22	204	

Table 3: Logistic Regression Analysis of Various characteristics with Anxiety status

Variable		Odds ratio	95% confidence interval	p value
Duration of DM	Less than 5 years			0.004
	≥ 5 years	0.298	0.13-0.68	
Comorbidities	No			0.3
	Yes	0.71	0.35-1.4	
Complications	No			0.05
	Yes	0.42	0.17-1.02	
HbA1c	No			0.8
	Yes	1.3	0.15-10.9	

DISCUSSION

In addition to being a chronic, progressive metabolic disease, type 2 DM also causes depression and anxiety, which lowers a person's life expectancy and overall health-related quality of life. In this study, all the admitted patients had some level of anxiety with the majority (74.2%) of them experiencing low anxiety levels while 25.8% had either moderate or potentially concerning anxiety status. A study by Nawaz et al in Pakistan demonstrated that majority of inpatients with type 2 DM experienced mild anxiety (66.6%).[13] In contrast to this, a study conducted in out patient population of type 2 DM revealed 50% frequency of anxiety.[14] Previous studies from Pakistan and India have demonstrated that hospitalized patients had much greater rates of anxiety compared to the outpatients.[15,16] A number of factors can be attributed to this greater prevalence, such as acute sickness, decreased mobility, social isolation, and other characteristics linked to hospital stays.

Approximately 74.2% of the study participants reported to have low level of anxiety, with the remaining experiencing higher scores on the BAI scale. Duration of DM, comorbidities like hypertension and ischemic heart disease and DM related complications such as neuropathy, nephropathy, and retinopathy were the main contributing factors. A similar study in Pakistan revealed that most (48%) of the subjects who reported anxiety had a low level of anxiety compared to those experiencing moderate (17%) and severe (35%) anxiety level.[17] The majority of the female patients in this study experienced more severe anxiety than the male patients, according to a within-group analysis with statistically significant results (p=0.001). Likewise in our study more females had higher levels of anxiety scores compared to males however these findings were not significant (p=0.1). A study by Nawaz et al. found a significant relation (p<0.01) between the education, gender, and profession of patients with anxiety.[13] This contrasts with the findings in our study where no significant association (p>0.05) was detected between gender, occupation, and anxiety status. The differences in findings could be because a different anxiety scale (Hamilton Anxiety Rating Scale) was utilized. A study in Malaysia revealed that only 9% of the patients with DM were found to have anxiety, with significant association found between anxiety status and education level and socioeconomic class.[18] These differences in the results are due to several reasons. Firstly, they included both in and outpatient population of DM. Secondly, they included patients with all types of DM, whereas our study comprised of only type 2 DM population. Thirdly, they utilized Seven-item generalized anxiety disorder scale (GAD-7) for rating the anxiety status.

Our study demonstrated a statistically significant association between anxiety and duration of DM, diabetes related complications, comorbidities but not with glycemic control. A similar study conducted in Taiwan by Wu et al. using BAI revealed that anxiety status was significantly (p= 0.009) associated with complications of DM.[19] A study by Bulut et al demonstrated a significant association (p < 0.05) between anxiety scores of diabetic patients and the duration of the disease.20 Other studies in Pakistan, India and Turkey have demonstrated similar association of anxiety status with the duration of the disease and the diabetes related complications.[15,16,21,22] Our study did not establish an association of anxiety status with the HbA1c level (p=0.2). This finding is supported by previous studies.[15,16]

CONCLUSION

Most of the admitted patients with type 2 DM experienced some level of anxiety. The combination of these two chronic, incapacitating disorders contributes to a decreased quality of life. Therefore, it is imperative to identify and treat anxiety in individuals with type 2 DM to enhance their general quality of life and lower the morbidity that comes with it.

LIMITATIONS

There are various drawbacks with this study. Firstly, since this was a cross-sectional study, a causal link between diabetes and anxiety symptoms cannot be established. Secondly, a psychometric scale was used to assess anxiety status rather than a structured interview, which makes it challenging to account for the physical aspects of mental symptoms.

Author's contribution

JAK conceived, designed, participated in data collection, did literature review, performed statistical analysis & drafted the manuscript.
SK participated in statistical analysis, literature review and interpretation of data, and helped in drafting the manuscript.
AAK did literature review, participated in data collection, and interpretation of data and helped in drafting the manuscript.
AHA conceived, designed, did literature review, performed statistical analysis & critically revised the manuscript.

All authors provided final approval for publication of the manuscript and are responsible for the integrity of the study.

Conflict of Interest

The authors confirm that no conflict of interest exists regarding this research.

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