

Original Research Article

Anxiety and depression versus treatment adherence among type II diabetes mellitus patients at government tertiary care institution, Madurai, Tamil Nadu

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Received: 27 March 2020

Revised: 09 May 2020

Accepted: 11 May 2020

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ABSTRACT

Background: Global, Indian and Tamil Nadu prevalence of diabetes mellitus (DM) was 8.5%, 7.7% and 10.4% respectively. Prevalence of anxiety or depression was higher among diabetics in comparison to general population. Treatment adherence was related to prevention of mortality and morbidity. Currently anxiety or depression are not looked for and data is scarce regarding the burden of anxiety or depression among type II DM patients. The objectives of the study were to estimate proportion(s) of type II diabetes patients having anxiety or depression; having treatment adherence and to determine the association between anxiety or depression and treatment non adherence.

Methods: We did cross sectional study among type II DM patients at Government Rajaji Hospital, Madurai and did consecutive sampling. The sample size of the study was 96 which was collected diet and exercise details. It used Morisky medication adherence questionnaire and hospital anxiety and depression scale to measure medication adherence and anxiety and depression. The study was calculated proportions and odds ratio with confidence intervals, obtained Ethics clearance and referred participants who had anxiety or depression to Psychiatrist.

Results: Proportion of anxiety or depression was 36.5% (27.3 to 46.4). 55% had adequate diet adherence, 48% had adequate exercise adherence, 68% had adequate medication adherence, 40% (29.8 to 50.1) had adherence to all the three. Odds of anxiety or depression among poor treatment adherents was 4.1 (1.6 to 11.4) times more in comparison to their counterparts.

Conclusions: Proportions of anxiety or depression and treatment adherence were 37% and 40% among diabetics. Anxiety or depression could be a potential risk factor for poor treatment adherence. We recommended screening for anxiety and depression in the follow up of diabetics.

Keywords: Type II DM, Anxiety, Depression and treatment adherence

INTRODUCTION

Globally 422 million individuals suffered due to diabetes mellitus (DM) during 2014. Global prevalence of DM 8.5% among individuals more than 18 years of age during the same year.¹ Worldwide prevalence of anxiety and depression among general population was 3.6% and 4.4% respectively in 2015.² Prevalence of anxiety among type

II DM reported from various countries ranged from 31.4% to 58.7%.³⁻⁸ Prevalence of Depression among diabetics ranged from 10.9% to 69%.³⁻¹⁵ In India, prevalence of DM was 7.7% in 2016 among individuals aged 20 years or older.¹⁶ Prevalence of anxiety and depression in general population were 3.5% and 2.7% respectively in India during 2015-16.¹⁷ A study done at Haryana state of India reported a prevalence or frequency

of anxiety as 27.6% among Type II DM patients.¹⁸ Prevalence or frequency of depression among diabetic patients in studies done at various parts of India was from 9% to 56.8%.¹⁸⁻²⁴ In Tamil Nadu, prevalence of DM was 10.4%.²⁵ Prevalence of common mental disorders (anxiety, depression and substance use disorders) was 11.3%.²⁶ Among diabetics, prevalence or frequency of depression from studies conducted at a Northern and a Southern district of Tamil Nadu were 39.7% and 40.5% respectively.^{27,28} Published studies with respect to anxiety among diabetics in Tamil Nadu and perhaps India are relatively scarce.

Prevalence of good treatment adherence was 39% in a hospital based study conducted at Tamil Nadu.²⁹ Treatment adherence was directly related to prevention of complications and hence prevention of mortality and morbidity due to DM.^{30,31} Studies done at various parts of world had suggested that untreated anxiety and/ or depression was associated with treatment non adherence and consequently increased mortality and morbidity.³²⁻³⁵

In our context, national programme for prevention and control of cancer, diabetes, cardio-vascular diseases and stroke is being implemented at all government institutions. Under this programme, individuals more than 30 years are screened for diabetes as one of the components. Those who are diagnosed with diabetes are being followed up with blood tests such as sugar, urea, creatinine and cholesterol every three months & BP measurement every month; cardiovascular assessment and ophthalmic assessment are done every year and referral services are provided whenever necessary.³⁶

Psychiatric comorbidity is not being considered in the programme and there is paucity of data regarding the burden of anxiety and/ or depression among Diabetes patients getting care at government health care setting at Tamil Nadu. Knowledge regarding the burden of anxiety or depression among diabetics would throw light regarding this unattended issue. Frequency of poor treatment adherence and its association with anxiety or depression, if significant, could attract the health authorities to consider inclusion of screening for anxiety or depression among diabetic patients in the programme guidelines. Hence, we conducted this study with following objectives.

Objectives

The objectives of the study were to estimate the proportion of anxiety or depression among type II DM patients who are followed at Government Rajaji Hospital, Madurai, to estimate the proportion of treatment adherence among them, to determine the association between anxiety or depression and treatment non adherence among them.

METHODS

We did cross sectional study among type II DM patients who had been at follow up at diabetology department of Government Rajaji Hospital, Madurai for at least six months after diagnosis. We excluded patients who were unwilling to participate and unable to communicate. We collected data during September 2019.

We defined anxiety as obtaining score of more than seven in anxiety domain and depression as score more than seven in depression domain of hospital anxiety and depression scale; treatment non adherence as non-adherence to any one of the following: diet, physical activity, medication; diet adherence as eating small frequent meals, avoiding sweet foods and drinks, taking adequate fiber and limiting the calories within the prescribed limit; physical activity adherence as walking for at least 30 minutes, at least five days a week or its equivalent exercise; medication adherence as obtaining score of six or more in Morrisky medication adherence questionnaire.

We did consecutive sampling. Our calculated sample size was 92. We calculated sample size for both the primary objectives and adopted the bigger one. Assumptions: for first objective, sample size was 92; based on expected frequency of psychiatric comorbidity 40%, allowable error 10% and 95% Confidence Interval (CI); for second objective, sample size was 91, based on expected frequency of treatment adherence 39%, allowable error 10% and 95% CI.

Primary investigator collected data using a proforma to collect base line details of patients, 24 hours diet survey and exercise details; used Morrisky Medication adherence questionnaire and Hospital anxiety and depression scales to measure medication adherence and anxiety and depression respectively.

The study was analysed data using Epi info software version 7.2.1.0. The study was calculated proportions with CIs (descriptive statistics). The study was analysed bivariate analysis to detect association between treatment non adherence and presence of anxiety and depression. The study was calculated odds ratio with CI (inferential statistic).

Study was approved by Institutional Ethics Committee of Madurai Medical College. We obtained permission from Head of Diabetology Department. We took care of confidentiality and privacy of study participants. We also obtained informed written consent from them. We referred those who had been found to have anxiety or depression to Department of Psychiatry, Government Rajaji Hospital for further evaluation and management.

RESULTS

Achieved sample size was 96. Median age of study participants was 60 and interquartile range was 54 to 65. Among the total 96 study participants, 34% (25 to 44.8) were males; seventy percent were currently married (59.6 to 78.8); forty percent (29.8 to 50.1) had education more than high school; fifty two percent (34.7 to 68.1) of males and 40% (28.2 to 52.1) of females were working (Table 1). Among all (96), 52% had been under follow up for Diabetes for more than eight years. All had been taking oral hypoglycemic agents and 4% were taking Inj. Insulin additionally for glycemic control; seventy one percent (68) had one or more physical comorbidities along with type II DM, among (68) which 79% had hypertension (Table 2).

Table 1: Socio demographic characteristics of study participants type II diabetics seeking care at government tertiary care institution, Madurai, Tamil Nadu (n=96).

Characteristics	N	%	95% CI (%)
Age more than 60 yrs (median)	41	42.7	33.1 to 52.8
Sex- male	33	34.4	25 to 44.8
Education more than primary school	38	39.6	29.8 to 50.1
Occupation working males (among total males 33)	17	51.5	34.7 to 68.1
Occupation working females (among total females 63)	25	39.7	28.2 to 52.1
Marital status currently married	67	69.8	59.6 to 78.8

Table 2: Physical comorbidity status of type II diabetics seeking care at government tertiary care institution, Madurai, Tamil Nadu.

Physical comorbidity	N	Total	%	95% CI (%)
Any other physical comorbidity	68	96	70.8	60.7 to 79.7
Hypertension alone	54	68	79.4	68.6 to 87.8
Ischemic heart disease alone	4	68	5.9	1.9 to 13.6
Both hypertension and ischemic heart disease	6	68	8.8	3.7 to 17.5
Neither hypertension nor ischemic heart disease	4	68	5.9	1.9 to 13.6

Among all (96), six percent had anxiety alone; ten percent had depression alone and 20% had both anxiety and depression. Occurrence of anxiety and/ or depression was

found to be 36.5% (Table 3). Among the total participants (96), 55% had adequate diet adherence; 48% had adequate adherence to physical activity. 68% had adequate medication adherence and 40% had adherence to all the above three treatment characteristics (Table 4).

Table 3: Psychiatric comorbidity of type II diabetics seeking care at government tertiary care institution, Madurai, Tamil Nadu (n=96).

Psychiatric comorbidity	N	%	95% CI (%)
Anxiety alone	6	6.3	2.6 to 12.5
Depression alone	10	10.4	5.4 to 17.8
Anxiety or depression	16	16.7	10.2 to 25.1
Anxiety and depression	19	19.8	12.7 to 28.7
Anxiety or depression	35	36.5	27.3 to 46.4

Table 4: Treatment adherence of type II diabetics seeking care at government tertiary care institution, Madurai, Tamil Nadu (n= 96)

Treatment adherence characteristics	N	%	95% CI (%)
Diet adherence	53	55.2	44.7 to 65.4
Physical activity adherence	46	47.9	37.6 to 58.4
Medication adherence	65	67.7	57.4 to 76.9
Treatment adherence	38	39.6	29.8 to 50.1

Table 5: Association between psychiatric comorbidity and poor treatment adherence among type II diabetics seeking care at government tertiary care institution, Madurai, Tamil Nadu (n=96)

	Poor treatment adherence	Adequate treatment adherence	Total
Anxiety and/ or depression	28	7	35
Neither anxiety nor depression	30	31	61
Total	58	38	96

Odds ratio with 95% CI: 4.1 (1.6 to 11.4).

Odds of having anxiety or depression was more among diabetics with poor adherence to treatment in comparison to those with adequate adherence; odds ratio was 4.1 (1.6 to 11.4) (Table 5).

DISCUSSION

More than one third of study participants had a psychiatric comorbidity in the form of either anxiety or depression or both. Nearly half of the study participants were following advice regarding diet and exercise adequately. Two third of them were adequately adhering to medications. When considering all together, adherence to adequate treatment got reduced to 40%. Having

psychiatric comorbidity may be a risk factor for poor treatment adherence.

Psychiatric comorbidity (anxiety or depression) could be a significant health problem among diabetic individuals considering the magnitude of frequency. As per present study, proportion of anxiety or depression was 36.5% with 95% CI of 27.3% to 46.4%. Scale used in this study was Hospital anxiety and depression scale. In a study conducted at a tertiary care hospital of Northern Tamil Nadu by Praveen et al, significant anxiety had been found to be 52% among diabetic patients; the scale used was hamilton anxiety rating scale.³⁷ In a study conducted at urban health training centre of Kancheepuram district by Anantha et al, proportion of depression among diabetics was found to be 39.7%; scale used was primary health questionnaire 9.²⁸

Adherence to overall treatment was low, exposing the majority patients to complications of diabetes. Treatment adherence was around 40% which was similar to study conducted by Shankar et al at Trichirapalli.²⁹ Medication adherence was 68% which was lower in comparison to the finding of a study conducted by Manikandan et al in a urban field practice area of Medical college and somewhat higher than that of a study by Venkatesan et al.^{38,39}

Positive association was identified by the present study; Similar finding had been shared by studies conducted among Tamil population by Ibrahim et al and Niraimathi et al.^{40,41} This study finding once again emphasized the necessity to screen for anxiety or depression to ensure better treatment adherence and hence prevention of mortality and morbidity among diabetics

Favorable response bias could have happened which could have led to over estimation of treatment adherence and underestimation of psychiatric comorbidity. In order to reduce the above, we avoided leading questions and followed a nonjudgmental attitude while conducting the interview; we used the translated versions of scales after adequate quality control in the form of back translation, internal consistency check and expert opinion about adequacy of scale translation. The study was not checked for confounders and effect measure modifiers due to limited sample size. Cause and effect relationship between psychiatric comorbidity and treatment adherence could not be established as temporal association cannot be ascertained. However even if the association is bidirectional or even reverse, it could not prevent us from insisting screening for anxiety or depression along with other measures to improve treatment adherence and quality of life of diabetic patients.

The study was concluded that frequency of anxiety or depression was 37% and treatment adherence was 40% among diabetics. Presence of psychiatric comorbidity could be a potential risk factor for poor treatment adherence which could possibly increase the occurrence

of complications of diabetes. Periodical screening and treatment of anxiety and depression could improve treatment adherence. In that way, it could increase the survival chance and quality of life of type II DM patients. The study was recommended inclusion of screening for anxiety and depression in the follow up guidelines of DM. The study was also recommended pre post evaluation regarding frequency of complications and quality of life, before and after implementation of screening and treatment for anxiety and depression for diabetic patients.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee of Madurai Medical College

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Cite this article as: Swamynathan M, Sivasubramanian P. Anxiety and depression versus treatment adherence among type II diabetes mellitus patients at government tertiary care institution, Madurai, Tamil Nadu. *Int J Community Med Public Health* 2020;7:2331-6.