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Major Depression as a comorbidity in Type 2 Diabetics: its association with diabetic symptom burden

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Abstract:
Objective: *To analyze prevalence of Major depression in T2DM patients & its association with diabetic symptom burden.*
Method: *Three hundred and twelve T2DM patients were evaluated. Socio-demographical & clinical profiling was done after due consent. Montgomery Asberg Depression Rating Scale (MADRS) was used to assess severity of depression & diagnosing Major depression. Several self-reported diabetic symptoms were compared in Major depression and No depression groups among the T2DM study sample. Impact of Major depression on reported diabetic symptoms was analyzed. Statistical analysis was done using SPSS version 14.0.*
Results: *The sample consisted of 52.88% females, 49.68% diabetics were in age group between 46-60 years.32.05% T2DM subjects had depression, with 56% being females. Mean duration of diabetes was 7.8 ± 2.42 years.Depression showed significant correlation with various common symptoms of diabetes like polyuria, abnormal thirst, blurred vision, cold hands and feet, feeling faint, shakiness, numbness in hands or feet, excessive hunger, daytime sleepiness and pain hands or feet.*
Conclusions: *An assessment of depressive symptoms amounting to a multidisciplinary syndromal approach is an essential part of holistic diabetic care.*
Keywords: *Depression, Diabetes, Symptom*

I. Introduction

Diabetes mellitus is a growing epidemic in the last 30 years. The WHO has estimated a rise in the prevalence of diabetes by 2030 from 2.8 % to 4.4% in all age group world-wide. The WHO estimates the diabetic population to increase from 171 million in 2000 to 366 million in 2030 worldwide[1]. The International Diabetic Federation (IDF) estimated a global mortality of 6.8 % in 2010 as a result of complications associated with diabetes [2]. The estimated prevalence is higher in men than in women[1]. India is expected to be the leading country with estimated prevalence of 79.4 million by 2030[1]. India has more than 50 million Type 2 diabetes patients [3]. The prevalence of type 2 DM among the urban population of India varies between 8-15% with a gradually increasing trend of urbanization [4].Depression by 2020 is estimated to be 5.7% of total global burden of disease, and would be second leading cause of disability-adjusted life years(DALYs), second only to ischemic heart disease[5]. According to the World Health Organization (WHO), depression is responsible for the greatest proportion of burden associated with non-fatal health outcomes and account for approximately 12% of total years lived with disability[2]. Depression leads to significant dysfunction, disability, poor control of life in sufferers and poses a significant burden on caregivers. Meta-analyses show a pooled relative risk between 1.6 and 1.8 for incident CHD in subjects with depression[6,7,8]. CVD is one of the leading complications and underlying causes of death in diabetics[9,10]. Therefore, increased CVD risks associated with depression pose a particular threat to the diabetic population. One of the challenges in the management of comorbid psychiatric disorders like depression among diabetics, is a low rate of suspicion &detection, as symptoms are mostly attributed to a chronic disease. Depression on other hand is also associated with failures to detect and diagnose diabetes.

II. Aims & Objective

The aim of the study was to study the occurrence of depression among Type 2 Diabetes Mellitus patients and its association with diabetes symptomatology.

III. Material And Method

Source of Data

In a cross sectional study, from April, 2013 to September, 2014, 312 Type 2 DM patients were evaluated at Department of Medicine, Mahatma Gandhi Medical College & Hospital (MGMCH), Jaipur, Rajasthan. Ethical committee permission was obtained before the conduct of the study.

Selection of subjects for the study:

Diagnosed cases of Diabetes Mellitus Type 2 (American Diabetes Association ADA criteria) for more than 1 year, with age more than 30 years were included in the study. T2DM patients with history of substance abuse, medication known to alter blood glucose levels or psychiatric treatment (pharmacological or non-pharmacological) or severe unstable condition were excluded from the study. An informed consent was taken from the patients.

Conduct of Study

After due informed consent, demographic & clinical data was collected. Montgomery Asberg Depression Rating Scale (MADRS) was used to form a diagnosis & assess severity of depression.

Statistical Analysis

Descriptive and analytical statistical analysis was done using SPSS version 14.0

IV. Results

Majority of the study subjects were between age group of 46-60 years (49.68%, 155) while one third (33.33%, 104) were more than 60 years old. Only 53 subjects (16.99%) were between 30-45 years of age. The mean age was 57.3 ± 7.4 years. The studied sample had higher number of females (165, 52.88%) than males (147, 47.12%). The duration of T2DM ranged between 1-24 years. The mean duration of diabetes in studied subjects was 7.8 ± 2.42 years

Table 1. Effect of depression on diabetes symptom burden

DIABETES SYMPTOM	MAJOR DEPRESSION (%)	NO MAJOR DEPRESSION (%)	ODDS RATIO	95% CI	
				Lower	Upper
Polyuria	56	33.02	2.31 *	1.81	2.64
Abnormal thirst	47	16.04	3.26 *	2.56	4.16
Blurred vision	37	13.68	3.39 *	2.71	4.22
Cold hands and feet	48	31.6	1.97 *	1.52	2.35
Feeling faint	11	2.8	4.12 *	2.16	5.65
Shakiness	40	14.15	3.28 *	2.62	4.12
Numbness in hands or feet	53	32.54	1.94 *	1.58	2.38
Excessive hunger	43	21.23	2.57 *	2.11	3.23
Daytime sleepiness	82	51.89	4.78 *	3.59	6.38
Pain hands or feet	45	25	2.32 *	1.76	2.75

* $p<0.001$

One Third (32.05%), of the T2DM subjects had Major depressive disorder (MDD); score of MADRS ≥ 7. Out of this 56% were females and 44% were males. On examining the association of co morbid depression in diabetic subjects with physical symptoms of poor glucose control (Table 1), this study found depression to be significantly associated with all 10 self-reported diabetes symptoms in depression group as compared with diabetes alone. This suggests that after controlling for potential confounders, patients with diabetes & depression were significantly more likely to report all ten studied diabetes symptoms compared to patients with diabetes alone (odds ratio ranging between 1.94 to 4.78).

Depressed diabetics had more than 4 times chances to present with symptoms like daytime sleepiness, feeling faint and more than 3 times with symptoms like abnormal thirst, blurred vision, shakiness as compared to non-depressed diabetic group. These finding suggests that presenting symptoms of T2DM may not just resemble those of depression causing missed diagnosis of either, but also depression may significantly blur the severity & control of T2DM. Depression may act as a confounding factor for glycemic control, further studies are recommended in this direction.

V. Discussion

Our study clearly shows significant association between depression & T2DM. In several studies, diabetes has been identified as an depressogenic condition[11,12]. Reddy et al in a metanalysis including 13 studies, reported prevalence rate of 7.9 to 8.9/1000 population, which is nearly twice in urban areas[13]. Another study suggests considerably higher prevalence of depression and anxiety in diabetes than in normal population, ranging between 12-28%[11].

Another study on 300 T2DM patients at PGIMER, Chandigarh, and reported that 23% met criteria for major depression and 18% for moderate depression[14]. The 23% to 45% prevalence of depression in T2DM reported in Indian studies can be due to varied treatment settings and socio-cultural factors [15,16].

Two major hypotheses currently exist to explain the causal pathway between diabetes and depression: The first hypothesis asserts that depression precedes type 2 diabetes (i.e. depression increases the risk of developing diabetes). Unfortunately, the mechanisms underlying the association between diabetes and depression are not clearly understood. In theory, the increased risk of type 2 diabetes in individuals with depression is believed to result from increased counter regulatory hormone release and action, alterations in glucose transport function, and increased immune inflammatory activation[17].

While studying, relationship of major depression to diabetes symptoms, depressed diabetics had more than 4 times chances to present with symptoms as daytime sleepiness, feeling faint and more than 3 times with symptoms like abnormal thirst, blurred vision, shakiness as compared to non-depressed diabetic group. Similar findings have been reported by earlier studies of diabetic patients from tertiary centers[18,19] and add to the growing body of literature describing a strong relationship between physical symptoms and psychological distress among persons with (as well as without) verifiable physical disease.

Depression was associated with similar large odds ratios for these diabetic symptoms, even after controlling for complications. It should be noted that none of the elevated diabetes symptoms other than daytime sleepiness or hunger could be considered neuro-vegetative signs of depression. People with depression tend to focus on illness episodes and medical symptoms[20] and selectively recall negative or unpleasant events[21]. There is also evidence that painful symptoms[22] and functional limitations [23] can induce psychological distress and depression. Our data do not allow conclusions regarding causation; however, depression can be viewed as a probable outcome of a chronic disease that is accompanied by significant physical symptoms. For many chronic diabetic patients, depression is associated with increased symptom burden, functional disability and medical costs[23].

VI. Conclusion

Depression is a very common undiagnosed comorbidity associated with diabetes, it adds to the symptom burden, long term morbidity and probably mortality of patient. Proper screening for depression in all T2DM patients may go a long way in effective care. Further studies need to be done on the impact of comorbid depression on glycemic control & mortality benefits of treating depression in T2DM patient.

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