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Association Between Depression and Diabetes

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Abstract

Introduction: Depression is one of the most common comorbid psychiatric disorders associated with diabetes, and impacts upon treatment course and prognosis. This study was designed to investigate the association between diabetes and depression as well as depression and glycemic control.
Material and Method: 375 diabetic patients (type II) from a diabetic clinic in the Doctor Shariati hospital and diabetes association of Iran participated in this cross-sectional study. Patients were screened for depression using the Beck depression inventory (BDI). Second stage interviews were conducted with depressed subjects to confirm DSM-IV depressive disorders category.
Results: Depression was diagnosed with Beck Depression Inventory in 41.9% of patients. Of these patients, major depressive disorder was confirmed in 23.7%, dysthymic disorder in 9.3% and association of two disorders in 0.8% of patients. Major depressive disorder was associated with the 31-59 year old group, female gender; poor diabetic control and diabetic complications. Dysthymic disorder was more prevalent in those over 60 years of age.
Conclusion: Depression occurs commonly in diabetes and is associated with female gender, poor glycemic control and diabetic complications. Therefore, glycemic control and prevention and treatment of diabetes complications may prevent depressive disorders in diabetics (German J Psychiatry 2004; 7: 62-65)

Keywords: diabetes mellitus, depression, dysthymic disorder, major depressive disorder, Beck Depression Inventory

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Introduction

According to recent studies, there are nearly 1.5 million diabetics in Iran (Larijani et al., 2001). Beside retinopathy, nephropathy and neuropathy, diabetes is associated with psychiatric disorders that affect patients' quality of life. Such effects may be due to alterations in diet, constant dependence on medication, short and long-term side effects and the burden of costs (Braunwald et al., 2001).

Depression is among the most common psychiatric disorders (Lustman et al., 1997). The incidence of depressive disorder among persons with type II diabetes mellitus is thought to be 8.5-14% and life-time risk is 11-32.5% (Goodnick et al., 1995). Based on other studies, 15-32.5% of diabetics have depression (Gavard et al., 1993, Lustman et al., 1997, De Groot et al., 1999, Davidson et al., 2000, Roy et al., 2001).

Anderson et al., (2001) reported that the incidence of depression is 2-3 times higher among diabetics than in non-diabetics (Gavard et al., 1993, Warnock et al., 1998, Lustman et al., 2000, Anderson et al., 2001). It has been suggested that 1 in 3 diabetic patients suffers from depression, leading to loss of function and reduced quality of life (Judd et al.,1995, Jacobson et al., 1997, Sullivan et al.,1999, Lyness et al.,1999).

Depression is a mood disorder diagnosed by depressed mood, guilt feeling, decrease in appetite, thinking about death and suicide, insomnia, fatigue and loss of energy, considerable weight loss and loss of function (Adock et al., 1998). In some diabetics, depression is thought to be a psychological reaction to the severe pain caused by neuropathy (Koracs et al.,1996). Also it has been proposed that there is a

relation between plasma glucose level and mood in diabetics; which means depression is more prevalent among diabetics with poor control (Lustman et al.,1992, Ahshuler et al.,1997). Studies also have shown associations between cerebral vascular involvement and depression in diabetics, even in the absence of hypoglycaemic episodes (Ahshuler et al., (1997) and Fleming et al., (1999). Visual impairment following retinopathy, multiple hospital admissions and sexual dysfunction may also contribute to depression in this group (Lishman et al., 1997).

Conversely psychiatric disorders may have a negative effect on blood glucose control. Effective treatment of comorbid depression may promote better blood glucose control (Peyrot et al., 1997, Lustman et al., 1997). Additionally the course of depression in diabetics may be less straightforward than in non-diabetics, (Sevincok et al., 2001).

The current study was designed to investigate associations between depressive disorders, diabetes and blood glucose control.

Patients and Methods

In this cross-sectional study, 375 type II diabetic patients (consecutive referrals; 222 female and 153 male) from diabetes clinics of Shariati hospital and the Iranian diabetic association were assessed. Inclusion criterion was definite diagnosis of diabetes type II based on ADA criteria (Alberti et al., 1998). Diabetic patients with other predisposing factors for depression such as underlying diseases (e.g. cancer) were excluded from the study. The study protocol was approved by the ethics committee of Endocrinology and Metabolism Research Center (EMRC) of Tehran University of Medical Sciences.

A proforma questionnaire (the standard questionnaire by Beck and DSM-IV) was completed for each patient by 2 trained physicians (who had been trained for the symptoms and signs of psychiatric disorders, specifically depressive disorders and filling out the questionnaire) who were blind to glycaemic control. After clarifying the study objectives for patients, written informed consent was obtained. The Beck Depression Inventory, a 21 item screening questionnaire comprising 13 cognitive and 8 somatic questions was used to screen for depression. The BDI has been well validated in diverse patient populations (Beck et al., 1961, Lustman et al., 1997, Sevincok et al., 2001). ADA and DSM criteria are the most popular diagnostic criteria for diabetes and depression in our country, which is why we used them to diagnose our patients. In addition, they have been used in several studies (Beck et al., 1961, Lustman et al., 1997, Sevincok et al., 2001). Based on the test results, patients scoring over 16 were considered depressed, and a second series of questions based on DSM-IV depression criteria were completed in depressed cases. After that patients were categorized into two groups: depressive and dysthymic disorders (based on DSM IV criteria). Blood glucose control was assessed by measuring HbA_{1C} levels, a reliable method for estimating glycaemic control over the last 90-120 days [Nethan et al., 1984). HbA_{1C} was measured by the liquid chromatography method. Values more than 7% were considered uncontrolled. The data were analyzed by descriptive tests and □□ in a 95% confidence interval using SPSS-10 soft ware.

Results

375 patients were recruited into the study. They ranged in age from 10-81 years (mean: 53.6±13.6 years). The mean duration of diabetes was 10.1 ± 7.5 years. Patients were categorized into 3 age groups: less than 30 years old, be-

Table 1. Prevalence of depressive disorders based on Beck Depression Inventory (BDI) and DSM-IV criteria according to the age, sex, blood glucose control and diabetes complications

	Depression based on BDI (%)		P value	MDD[1] based on DSM IV criteria (%)		P value	Dysthymia based on DSM IV criteria (%)		P value
	Positive	Negative		Positive	Negative		Positive	Negative	
Female	30.4% (114)	28.8% (108)	<0.001	17.3% (65)	41.9% (157)	0.004	8% (30)	51.2% (192)	
Male	11.5% (43)	29.3% (110)		6.4% (24)	34.4% (129)		1.3% (5)	39.5% (148)	0.001
<30 years	6.9% (26)	7.7% (29)		2.9% (11)	11.7% (44)		1% (4)	13.6% (51)	
31-59	20.8% (78)	27.5% (103)	0.45	14.4% (54)	33.9% (127)	0.003	3.7% (14)	44.6% (167)	0.3
>60 years	14.1% (53)	22.9% (86)		6.4% (24)	30.7% (115)		4.5% (17)	32.5% (122)	
With complication	26.9% (101)	28% (105)	1.27	15.7% (59)	39.2% (147)	0.01	5.6% (21)	49.3% (185)	0.5
With out complication	15% (56)	30.1% (113)		8% (30)	37% (139)		3.7% (14)	41.4% (155)	
With blood glucose control	11.5% (43)	24.8% (93)		4.8% (18)	31.5% (118)		3.7% (14)	32.6% (122)	
With out control	30.4% (114)	33.3% (125)	0.002	18.9% (71)	44.8% (168)	<0.001	5.6% (21)	58.1% (218)	0.6

tween 31 and 59 years old and over 60 years, whereby most patients were in the second group (181 cases, 48.3%) and the least were in the first group (55 cases, 14.7%). From HbA1C results, glycaemic control was categorized as poor in 63.7% (239) of patients. 54.9% (206) of cases had at least one complication of diabetes. Mean BDI score was 14.2 ±10.3 with 41.9% (157) of patients achieving caseness for depression.

Based on DSM-IV questionnaire, major depressive disorder (MDD) was diagnosed in 23.7% (89) and dysthymic disorder in 9.3% (35) of patients. Table 1 shows the frequency of depression based on Beck Depression Inventory and DSM-IV criteria and its relation with sex, age, systemic diabetes complications and blood glucose control. In some cases the onset of depression was prior to diabetes diagnosis and these patients were receiving antidepressant drugs (data not shown).

The prevalence of depressive caseness on the BDI was significantly greater in females than males (CI 95%: 0.23-0.57 OR=0.3). Also in patients with systematic complications of diabetes, depression was more common than those without diabetic complications (CI 95%:,1.27-2.95 OR=1.9), as well as in patients with uncontrolled blood glucose who had a higher depression rate than the control group (CI 95%: 0.32-0.78 OR=0.5); at the same time, depression frequency and patient age did not show a significant relationship.

DSM-IV major depressive disorder was associated with female gender (CI 95%: 0.28-0.79, OR=0.4); age 31-59 years ($\chi 2$: 6.6, P=0.03); systematic complications of diabetes (CI 95%: 1.16-3.12, OR=1.9); and poor glycaemic control (CI 95%: 0.20-0.62, OR=0.3).

DSM-IV dysthymia was associated with female gender (CI 95%: 0.08-0.57, OR= 0.2) but there was no association with age, glycaemic control, or systemic diabetic complications.

Discussion

Depression in diabetics is a multifactorial disorder arising from biological and psychosocial factors and this association increases the risk of diabetes in healthy people (Talbot et al., 2000). The prevalence of depression among diabetics has been studied in different surveys and an association with female gender has been previously reported (Lustman et al., 1986, Lustman et al., 1988, Peyrot et al., 1997, Anderson et al., 2001, Sevincok et al., 2001, Zeneto et al., 2002, Blazer et al., 2002). However Kovac et al (Kovacs et al., 1997) and Mortazavi (Mortazavi J., 1997) did not find any relation between gender and depression in diabetics. Our study showed associations between depression in diabetes and age 31-59 years while dysthymia was more frequent in those over 60 years old. Some earlier studies failed to find any relationship between age and depression in diabetes (Lishman et al.,1997, Blazer et al., 2002). Lustman et al. (1997) found that depressed diabetics were younger than non-depressed ones.
In addition, we found a significant relationship between depression frequency and glycaemic control. In other words, diabetics with good blood glucose control were less likely to be depressed than patients with poor glycaemic control as assessed by HbA_{1c} (Ahshuler et al., 1997, Trief et al., 1998, De Groot et al., 1999, Vanfilburge et al., 2001, Zeneto et al., 2002). Among diabetics, effective treatment of depression has been found to be associated with improved glycaemic control (Lustman et al.,1997, Lustman et al., 1998, Lustman et al., 2000). One study failed to find any relationship between severity of depression and HbA_{1C} level (Sevincok et al., 2001).
In the present study depression was associated with diabetic complications as in earlier studies (Roy et al., 2001, Zento et al., 2002 De Groot et al., 2001). A control group was not included in our study and this is one of the study limitations.
In summary, depression is an important psychiatric complication of diabetics and is more frequent among females; those with uncontrolled diabetes and those with systemic diabetic complications. Further research is needed to determine whether effective treatment of comorbid depression in diabetics would reduce hyperglycemia and diabetic complications.

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