

SCREENING FOR DEPRESSION IN DIABETIC PATIENTS

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ABSTRACT

Background: Diabetes mortality is increased when accompanied with depression. Screening for depression is recommended by national and international authorities.

Aims & Objective: To have an estimate of the diabetic patients at risk of depression and to identify the risk factors for depression in diabetic patients.

Material and Methods: The study was designed as a cross-section design. Two hundred and three patients were selected by convenience sample. Diabetic patients of either sex, 18 years and older, new to the clinic or follow up were included. Mentally retarded patients or with psychiatric disease were excluded. An interview questionnaire was used for data collection. The two-item version of patients' health questionnaire (PHQ-2) was used as a screening tool.

Results: Patients with PHQ-2 positive were constituted 45.8%. Depression was associated with female gender ($p=0.049$), long standing diabetes ($p=0.035$), insulin use ($p=0.024$), and with other medical comorbidities ($p=0.006$).

Conclusion: Although all diabetic patients are at risk of having depression, female gender, long standing diabetes, insulin use and having medical comorbidities are at higher risk.

Key-Words: Diabetes Mellitus; Depression; Screening; Saudi Arabia

Introduction

Diabetes mellitus (DM) continues to be a major threat to global public health.^[1] Worldwide, the prevalence of diabetes for all age groups was estimated to be 2.8% in 2000 and 4.4% in 2030.^[2] The number of people with diabetes in the world is expected to be approximately double between 2000 and 2030; from 171 million in 2000 to 366 million in 2030.^[2] The greatest relative increases will occur in the Middle Eastern crescent, sub-Saharan Africa, and India.^[2] In Saudi Arabia, between 1995 and 2000, the prevalence of DM in adults (30-70 years) was 23.7%.^[3] There is evidence of high prevalence of psychological ill health in people with diabetes, notably depression. A meta-analysis of 42 eligible studies^[4], found the odds of depression in the diabetic group were twice than of the non-diabetic comparison group (OR 2.0, 95% CI 1.8 –2.2) and did not differ by sex, type of diabetes, subject source or assessment method.

In the US, the estimated prevalence of major depression in diabetic patients was 8.3%.^[5] In a large population study in Norway, type 1 diabetics had 15.2% depression while type 2 patients had 19%.^[6] In United Arab Emirates, a study conducted in Sharjah indicated that 12.5% of diabetic patients have mental illness, primarily depression or anxiety disorders.^[7] In Iran, a study showed that 43.4% of diabetic patients included in the study had depression

based on Beck depression inventory.^[8] In Saudi Arabia, a study of prevalence of somatization and depression in family medicine conducted in Riyadh, in 2001^[9], found that depression prevalence was 20% which was similar to that published in the USA and worldwide. In another study conducted in 2002 measuring the prevalence of mental illness in family medicine setting in Al-Kharj^[10], it was found that 18.2% of family medicine patients have minor mental illnesses including depression, anxiety and somatization and when sub-threshold cases included, it reached 30.5%. In the same study, diabetic patient's prevalence of mental illness was 16%. Recently in 2011, in Saudi Southeastern region, a study^[11], screened patients attending family medicine clinics for depression, and the prevalence was 12%, about half of them were mild in severity.

Comorbid depression in people with diabetes forms a serious threat to their quality of life.^[12] Patients with both depression and diabetes are found to be at increased risk for the development of cardiovascular complications of diabetes and to have increased mortality rates and higher health care costs.^[13,14] Managing depression in diabetic patient has been found to be beneficial. Rubin and colleagues^[15], have found that pharmacologic and psychological approaches are effective for depressed diabetic patients, and that successful treatment also produces improvements in glycemic control, overall

functioning and quality of life. In another randomized, controlled trial of antidepressant treatment in 68 patients with type 1 and type 2 diabetes, improvements in depressive symptom predicted improved glycemic control.^[16] Moreover, a randomized controlled trial of cognitive behaviour therapy for depression demonstrated that improvement in depression score corresponded with improvement in glycemic control.^[17] Other randomized controlled studies have observed that improvements in glycemic control are correlated with improvements in depressive symptoms.^[18,19]

Screening adults for depression is recommended by deferent authorities. In 2005, a Cochrane review found that routine depression screening had minimal effect on the management or outcomes of depression after six or 12 months of follow-up.^[20] However, the U.S. Preventive Services Task Force (USPSTF) published more recent recommendation about depression screening^[21], and concluded that treatment with antidepressants, psychotherapy or both decrease the clinical morbidity and improve outcomes in adults with depression identified through screening in family medicine settings. Furthermore, the USPSTF found no evidence of harms of screening for depression in adults. Diabetic care standards and guidelines include, *American Diabetes Association*, *American Association of Clinical Endocrinologists*^[22], and *Canadian Diabetes Association*^[23], recommend screening for psychosocial status at diagnosis, during regularly scheduled management visits, during hospitalizations, at discovery of complications or when problems with glucose control, quality of life or adherence are identified. Patients are likely to exhibit psychological vulnerability at diagnosis and when their medical status changes. However, formal assessment of psychological wellbeing is not a standard part of practice in diabetes care in the UK.^[24] Only general recommendations have been made regarding being alert to problems, availability of skills to manage routine psychological disorders and of appropriate referral to those with special expertise where the condition is more severe. The national reference of clinical guidelines for care of diabetic patients in primary health care in Saudi Arabia^[25], recommends that all individuals with diabetes and their families should be regularly screened for symptoms of psychological and social distress. There is a paucity of information about the prevalence of depression in diabetic patients. Such information can shape health care provision and improve diabetic patient care.

Objectives: (i) Primary: To have an estimate of the diabetic patients at risk of depression. (ii) Secondary: To identify the risk factors of depression in diabetic patients.

Materials and Methods

Setting and Recruitment: The study was conducted between December 2011 and February 2012, which is – the three months- the interval for patient follow up in the chronic diseases clinics (CDC) at Al-Wazarat Family Medicine Health Center. It is the main family medicine center for Riyadh Military Hospital (RMH), located in the middle of Riyadh city, the capital of Saudi Arabia. These clinics offer multidisciplinary care for diabetes, hypertension and bronchial asthma, for patients newly diagnosed and patients with complications. Al-Wazarat Center provides primary medical care to about 80% of Saudi military and civilians under the Medical Services Department of the Ministry of Defence and Aviation and serves about 25000 patients per month. The population is highly representative of the Saudi socio-demographic structure. Patients' population included all RMH eligible CDC outpatients. These clinics are providing care for about 1800 patients per month. Diabetic patients of either sex, 18 years and older who were new or follow-up were included. Mentally ill or retarded patients and patients with pre-diagnosed depression or mental disease prior to the index visit were excluded. A sample size of 191 patients was calculated from the target population (5400 patients, cumulative of three months) with an estimated prevalence of depression to be 15%, 95% confidence interval and 5% power of the study. The sample sized was increased to 203 patients to compensate for the expected non-response. Convenience sampling was used to include the patients, in which all the patients who were satisfying the inclusion and exclusion criteria were interviewed until the required sample size was reached.

Data Collection Process: Data collection was done by the researcher using an interview questionnaire, which contained four parts. The first part was used to fill up the patient identification data, including patient's name, medical record number, date and time. The second part had patient demographic data, which included age, sex, marital status, income level, number of children, level of education, employment details and residence. The third part was used for patients' past medical history. Details of diabetes, which include time since diagnosis, type of therapy, HbA1c level and body mass index (BMI) were obtained from the patient's medical record. The Fourth part was for PHQ-2 test result. For the interviewer, four-hour training was conducted by a senior mental health consultant to avoid any bias or misunderstanding about the use the PHQ-2. Patients were interviewed in a private clinic just before they consulted their physician. Collected

data were coded, verified and entered to computer database. Data were analyzed using version 17 of the Statistical Package for the Social Sciences (SPSS). Results were cross-tabulated to examine the relationships between the variables. Simple descriptive statistics were applied as frequency distribution for categorical variables and mean and standard deviation for continuous variables as appropriate. Chi-square test was used to look for significant differences between categorical variables.

Screening Tool: The Arabic version of PHQ-2 screening tool was used.^[26] The two questions of the PHQ-2 asked patients to rate the frequency they had a depressed mood and/or lack of pleasure in usual activities in the past two weeks on a 4-Likert scale of 0 (not at all) to 3 (nearly every day). The total score ranges from 0 to 6 and any score of 3 or more is considered positive.

Ethical Considerations: The study protocol was approved by the family medicine department research and ethics committee. Verbal consent was obtained from all research participants. Study results were confidential. Patients screened positive for PHQ-2 were advised to arrange an appointment with their family physician for further management.

Results

Two-hundred and eighteen patients were interviewed; nine patients refused to participate and six patients were excluded from the study (five patients were previously diagnosed with depression and one patient was having hearing impairment). Two hundred and three were included in the study. Most of the patients were women, middle age (41-60 years), married with more than six children, urban, not educated, not employed and with low to moderate income level (Table 1).

Regarding patients medical characteristic, the majority were having long standing and uncontrolled diabetes, with HbA1c equal or more than 7%. Most of them were using oral diabetic medications instead of insulin and were obese with co-morbid conditions. (Table 1). Patients screened positive for depression (PHQ-2 positive) by the researcher composed almost half of the total sample (45.8%) (Table 3). The PHQ-2 positive result was statistically significantly associated with female gender (p=0.049), long standing diabetes (p=0.035), use of insulin (p=0.024) and medical comorbidities (p= 0.006). There was no association between patients with diabetes alone and positive PHQ-2 (Tables 2).

Table-1: Patients' demographic and medical characteristics (N= 203)

Characteristics	N		[%]	
Gender	Woman	107	52.71	
	Man	96	47.29	
Age	20-40	20	9.85	
	41-60	128	63.05	
	61+	55	27.09	
Residence	Urban	175	86.21	
	Rural	28	13.79	
Marital status	Married	164	80.79	
	Un-married	39	19.21	
No. of children	<4	19	9.36	
	4-6	56	27.59	
	7+	128	63.05	
Level of education	Educated	72	35.47	
	Not educated	131	64.53	
Working status	Working	42	20.69	
	Not working	161	79.31	
Income status	Low	81	39.90	
	Medium	100	49.26	
	High	22	10.84	
Duration of DM diagnosis	Newly diagnosed	77	37.93	
	Long Standing	126	62.07	
HbA1c	Controlled	58	28.57	
	Uncontrolled	142	69.95	
Treatment of diabetes	OHA/Diet	107	52.71	
	Insulin	96	47.29	
BMI	Normal	78	38.42	
	Obese	124	61.08	
DM with other comorbid diseases	Non	10	4.93	
	1-2	130	64.04	
	3+	63	31.03	

DM: diabetes mellitus; HbA1c: Glycosylated hemoglobin; OHA: oral hypoglycemic agents; BMI: body mass index

Table-2: Relation between depression (PHQ-2 positive) and patients' sociodemographic characteristics (N=203)

Characteristics	PHQ-2				P value	
	Positive		Negative			
	N	(%)	N	(%)		
Gender	Woman	51	46.4	56	60.2	0.049
	Man	59	53.6	37	39.8	
Age	20-40	9	8.2	11	12.1	0.475
	41-60	68	61.8	60	63.7	
	61+	33	30.0	22	24.2	
Residence	Urban	99	90.0	76	81.7	0.088
	Rural	11	10.0	17	18.3	
Marital status	Married	91	82.7	73	78.5	0.446
	Un-married	19	17.3	20	21.5	
No. of children	<4	13	11.8	6	6.5	0.377
	4-6	28	25.5	28	30.1	
	7+	69	62.7	59	63.4	
Level of education	Educated	65	59.1	66	71.0	0.078
	Not educated	45	40.9	27	29.0	
Working status	Working	25	22.7	17	18.3	0.329
	Not working	85	77.3	76	81.7	
Income status	Low	43	39.1	38	40.9	0.881
	Medium	54	49.1	46	49.5	
	High	13	11.8	9	9.7	
Duration of DM diagnosis	Newly diagnosed	49	44.5	28	30.1	0.035
	Long Standing	61	55.5	65	69.9	
HbA1c	Controlled	30	27.3	28	30.1	0.656
	Uncontrolled	80	72.7	65	69.9	
Treatment of diabetes	OHA/Diet	66	60.0	41	44.1	0.024
	Insulin	44	40.0	52	55.9	
BMI	Normal	47	42.7	32	34.4	0.226
	Obese	63	57.3	61	65.6	
DM with other comorbid diseases	Non	5	4.5	5	5.4	0.006
	1-2	81	73.6	49	52.7	
	3+	24	21.8	39	41.9	

DM: diabetes mellitus; HbA1c: Glycosylated hemoglobin; OHA: oral hypoglycemic agents; BMI: body mass index

Discussion

The study results show high percentage of depression in diabetic patients. Considering the serious combination between diabetes and depression and the ease of use of the screening tools, this finding is of importance in improving the care of diabetic patients, especially addressing depression by screening for further management.

Screening patients with the Arabic (Tunisia) version of PHQ-2 was easy to conduct, took about two minutes and was well accepted by patients, even the elderly ones. Considering the specificity of the PHQ-2 (67%) in detecting depression, the rate of patients screened positive was high in this study (45.8%) although this is not reflecting the prevalence of depression, as we need to confirm the diagnosis by using other more specific diagnostic tools, e.g. PHQ-9. This can be explained by the fact that most of our patients (95.1%) are having comorbidities other than diabetes, specifically dyslipidaemia and hypertension. Comorbid diseases and diabetic complications are well known risk factors for depression.^[27] In patients with diabetes only, the percentage was low (5.4%) in comparison to other studies. Anderson and colleagues^[9], found by a meta-analysis, that in uncontrolled diabetic patients, the prevalence of depression was about 30%, and again Al-Khathami and Ogbeide^[15], in 2002, at Al Kharj, Saudi Arabia, found that the prevalence of depression in diabetic patients was 16%. This difference emerged probably because of the small sample size of our stratified diabetic only group of patients as being 10 patients only. On the other hand, recently in 2011, Abdelwahid and Al-Shahrani^[16], found in the southeastern region of Saudi Arabia that depression was not associated with diabetes. This is probably because of their study population which consists of young patients; mean age was 29.9 years (SD 7.1) and that indirectly reflects the low prevalence of chronic diseases among them.

Being a woman, with long standing diabetes, insulin use and with medical comorbidities were also found to be associated with the risk of having depression. These risk factors were also documented by other studies in different countries^[28-31], and including Saudi Arabia.^[15,16] However, the other factors, such as being single, unemployed, uneducated, low income, obese and with uncontrolled diabetes were not associated with increased risk for depression in this study and this is probably because of patients' small sample size, since this was a secondary objective of this study.

Although all diabetic patients are at risk of having

depression, female gender, long standing diabetes, insulin use and having medical comorbidities are at higher risk. These findings are of importance in improving our care of diabetic patients especially addressing depression by screening for further management. Such information can shape health care provision and the continuous professional development in the health care organization.

Conclusion

This study reinforce the importance of screening for depression by using PHQ-2 and to have a multidisciplinary team in the chronic diseases clinic that includes psychiatrists and psychologists for further management for depression. Further studies are indeed needed to standardize and validate an Arabic (Gulf region) version of the PHQ-2. Since the PHQ-2 is considered a tool for screening, this study can be re conducted using PHQ-9 to detect the exact percentage for the prevalence of depression among diabetic patients and to include patients from many centers in Riyadh or preferably multi central among the Gulf countries.

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