SAS Journal of Medicine ISSN 2454-5112
SAS J. Med., Volume-3; Issue-2 (Feb, 2017); p-42-48
Available online at http://sassociety.com/sasjm/

Original Research Article

Depression and Diabetes: "A loosing combination"

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Abstract: Studies have shown that there is significant Quality of Life impairment in patients suffering from depression with co-morbid diabetes mellitus. The objective of this study was to compare the Quality of Life (QOL) in patients with depressive illness with and without Type II Diabetes Mellitus. It was a single centered cross sectional study which included patients from in and out patient departments of Institute of Psychiatry at a tertiary care hospital in Rawalpindi, Pakistan. This duration period of the study was 6 months from September 2014 till March 2015. 100 patients were included. All patients were administered the World Health Organization Quality of Life Toolkit Brief Version. Quality of life was compared by dividing patients with depression into two groups; one having depression and diabetes mellitus and the other one having depression without diabetes mellitus. Amongst the participants, 66 (66%) had impaired quality of life while in 34 (34%) there was no impairment, and there was a significant association between presence of co-morbid diabetes mellitus and quality of life Impairment. The study found a greater degree of quality of life impairment in depressed patients who had diabetes mellitus.

Keywords: Quality of life, Depressive Illness, Diabetes Mellitus type 2, Pakistan.

INTRODUCTION

Major depression is a prevalent mental disorder in the general population and is a leading cause of disease burden. The annual prevalence of major depression in Canada and in the United States was 4.8% and 6.8% in 2002, respectively [1]. A study in Pakistan showed Mean overall prevalence of anxiety and depressive disorders in the community population to be 34% [2].

Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycemia. It is a chronic disease that causes short- and long-term complications [3]. Evidence suggests that the prevalance of depression is elevated in those with chronic illnesses such as diabetes [4]. Depression has been bi-directionally associated with diabetes mellitus. Subjects who are depressed are more likely to develop type 2 diabetes mellitus. on the other end of the spectrum .Patients suffering from diabetes mellitus are also at a higher risk of being diagnosed with depression compared to normal population [5]. The prevalence of major depression in patients with DM is mostly estimated around 12% (ranging from 8-18%), while milder types of depression or elevated depressive symptoms, in general, are reported to be present in 15-35%. Compared to non-diabetic controls, patients with DM are reported to be about 1.4-3 times as likely to suffer from comorbid depression [6].

There are few studies on the prevalence of depression in diabetes done in our region. In a study done in Bangladesh the prevalence of depressive symptoms was 34% in patients of diabetes [4]. Depression prevalence was 14.7% amongst those with diabetes in a study done in Pakistan [7]. Risk factors associated with the presence of depression in patients with diabetes include female sex, younger age, not having a spouse, poor social support, lower education, low socioeconomic status, poor glycemic control, presence of diabetic complications, and presence of medical comorbidity, physical impairment and previous history of depression [8].

The presence of depression in DM has been associated with significant negative impact in self-care,

glycemic control, health outcomes and quality of life [9]. Quality of life (QOL) refers to the ways in which health, illness, and medical treatment influence an individual's perception of functioning and well-being [3, 6]. QOL has been recognized as a domain of major importance in patients with chronic diseases, including DM. It is regarded as a major outcome that should be taken into account when evaluating the goals and effectiveness of any therapeutic plan [6].

Several studies have shown that QOL in diabetes is decreased as compared to individuals without diabetes. Depression is known to have a considerable impact on QOL. Ali *et al.;* conducted a systematic literature review as well, including 14 cross-sectional studies, and concluded that depression had a significant negative impact on QOL of patients with DM [8]. Depression may thus be an important determinant of QOL in diabetes [5]. Increased prevalence of depression in diabetic patients points to the fact that evaluating the effects of co-morbid depression on QOL in diabetes will have relevant clinical outcomes. If we show that depression has a negative influence on QOL, we will be able to improve the QOL in patients by early detection and treatment of depression. There is dearth of research in our region which studies the quality of life of patients with depression and diabetes. According to one study in depressed patients quality of life impairment was 63% [10].

The objective of the study was to assess the quality of life in depressed patients with and without Diabetes Mellitus as a co-morbid.

METHODOLOGY:

It was a single centered cross sectional survey conducted at in and out patient department of a tertiary care hospital in Rawalpindi, Pakistan with non-probability convenience sampling technique including. A total of 100 respondents over a time period of 6 months from September 2014 – March 2015 were included in the survey. Informed consent was obtained from all participants. The protocol was approved by the Bioethics Committee and institutional review board of the tertiary care hospital in Rawalpindi, Pakistan in accordance with the Declaration of Helsinki.

Quality of Life (QOL) was measured using the World Health Organization Quality of Life Scale Brief Version (WHOQOL-BREF) (ANNEXURE A). It consists of 26-items where the responses are scored in a Likert scale fashion from 1 to 5. Total score is 130. Good quality of life was if score was >90 and impaired when it is < 90. Depression was diagnosed using the International Classification of Diseases version 10 (ICD 10) criteria, in which at least 4 symptoms are present for two weeks duration [11] (ANNEXURE B). Type II Diabetes Mellitus was diagnosed using the WHO criteria where fasting plasma glucose level ≥ 7.0 mmol/l (126 mg/dl) and random plasma glucose ≥ 11.1 mmol/l (200 mg/dl)

ANNEXURE A

WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one. Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks.**

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Very poor <25%	Poor >25%-50%	Neither poor nor good >50-75%	Good >75%-90%	Very good >90%
1.	How would you rate your quality of life?	1	2	3	4	5
		Very Dissatisfied <25%	Dissatisfied >25%- 50%	Neither satisfied nor Dissatisfied >50%-75%	Satisfied 75-90%	Very Satisfied >90%
2.	How satisfied are you with your	1	2	3	4	5
		Not at all	A little <25%	A moderate Amount > 25%-50%	Very much >50%-75%	An extreme amount >75%
3.	To what extent do you feel that physical pain	5	4	3	2	1

	prevents you from doing what you need to do?					
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5
		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5
8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little <25%	Moderately >25%-50%	Mostly >50%-75%	Completely 75%
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor Not at all	Poor Once in 2 weeks	Neither poor nor good 2-3 times in 2 weeks	Good 3-4 times in 2 weeks	Very good >4 times in 2 weeks
15.	How well are you able to get around?	1	2	3	4	5
		Very Dissatisfied <25%	Dissatisfied >25%-50%	Neither satisfied nor Dissatisfied >50%-75%	Satisfied 75%-90%	Very Satisfied 90%
16.	How satisfied are you with your sleep?	1	2	3	4	5

17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5
20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never <25%	Seldom >25%-50%	Quite often >50%-75%	Very often >75%-90%	Always>90 %
26.	How often do you have negative feelings such as blue mood, despair, anxiety, Depression?	5	4	3	2	1

Do you have any comments about the assessment?

ANNEXURE B

ICD-10 CRITERIA FOR DEPRESSION

In typical depressive episodes of all three varieties described below (mild (F32.0), moderate (F32.1), and severe (F32.2 and F32.3), the individual usually suffers from depressed mood, loss of interest and enjoyment, and reduced energy leading to increased fatigability and diminished activity. Marked tiredness after only slight effort is common. Other common symptoms are:

a. Reduced concentration and attention;
b. Reduced self-esteem and self-confidence;
c. Ideas of guilt and unworthiness (even in a mild type of episode);
d. Bleak and pessimistic views of the future;
e. Ideas or acts of self-harm or suicide;
f. Disturbed Sleep
g. Diminished appetite

Inclusion criteria:

Patients meeting operational definition criteria for Depression with and without type 2 DM with Ages 18-65.

Exclusion criteria:

Patients who were cognitively impaired (patients with delirium, dementia); physically unstable (recent acute MI, stroke or any major medical condition) and who refused to give informed consent were excluded.

DATA ANALYSIS:

All the collected data was analyzed in the Statistical Package for Social Sciences (version 20.0)

for the continuous variables i.e. age, mean ± S.D was calculated. For the categorical variables; Gender, Diabetes Mellitus, Educational status, Economic status, Quality of Life score, frequencies and percentages were presented. The chi-square analysis was done to compare quality of life impairment amongst depressed patients with and without Diabetes Mellitus and the association was considered statistically significant if p value was ≥ 0.05. Effect modifiers like age, gender, educational status, economic status, were controlled by stratification. Post stratification Chi square test was applied.

RESULTS

This study was carried out for a period of 6 months from September 2014 till March 2015. There were 100 respondents. The mean age of the participants was 44.61 years with S.D ± 14.144. There was a female preponderance with 31 (31%) males and 69 (69%) females. Among the participants, 34 (34%) had diabetes Mellitus while 64 (64%) were non-diabetics. Between the respondents, 66 (66%) had impaired quality of life while in 34 (34%) there was no impairment. Amongst the participants, 32 (32%) belonged to low socioeconomic group, 33 (33%) belonged to middle socioeconomic group and 35 (35%) belonged to high socioeconomic group. In the educational background 17 (17%) had no formal education, 22 (22%) were educated till grade 5th, 13 (13%) were educated till grade 8th, 24 (24%) %) were educated till grade 10th, 11 (11%) had done their Bachelors, while 13 (13%) %) participants had acquired their Master's degree.

There was no statistical association which was established among quality of life when cross tabulated with age, gender, economic status, and educational background. However there was a significant correlation which existed between quality of life impairment among two groups with and without Diabetes with a p-value < 0.013.

Table 1: Age groups of participants

Age		Frequency
	18-45 years	49
	46-65 years	32
	> 65 years	19
	Total	100

Table 2: Quality of life among participants

Quality of life impairment		Frequency
	Impaired	66
	Not impaired	34
	Total	100

Table 3: Quality of life impairment with and without Diabetes

Diabetes Mellitus		Quality of life impairment		Total
		Impaired	Not impaired	
	Present	28	6	34
	Absent	38	28	66
Total		66	34	100

Table 4. Chi-Square Tests among the subgroups with and without Diabetes

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	6.139[a]	1	.013		
Continuity Correction[b]	5.085	1	.024		
Likelihood Ratio	6.545	1	.011		
Fisher's Exact Test				.015	.011
Linear-by-Linear Association	6.078	1	.014		
N of Valid Cases	100				
a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 11.56.					
b. Computed only for a 2x2 table					

DISCUSSION

The occurrence of depression appears to be linked with the occurrence of diabetes. In 1684, Thomas Willis, the physician who first identified glycosuria as a sign of diabetes, suggested that diabetes resulted from 'sadness or long sorrow and other depressions or disorders' [12]. Further studies have demonstrated that a co-morbid state of depression incrementally worsens health compared with depression alone. According to the latest global burden of disease estimates unipolar depressive disorder are third in the ranking (65.5 mil DALY worldwide of which 26.5 in LICs). Unipolar depressive disorders are set to become the leading disease in 2030 with 6.3% of the overall burden and Diabetes the 10th place with 2.3% as a percentage of the overall DALYs [12].

Studies have scrutinized the association of diabetes with depression and the bidirectional nature of this relationship; considering that depression may occur as a consequence of having diabetes, but may also be a risk factor for the onset of type 2 diabetes [13, 14]. One study showed how there is a higher risk of mood and anxiety disorders among individuals with diabetes relative to those without, with an odds ratio for depression of 1.38 (95% CI 1.14-1.66) after adjusting for age and gender [15]. A meta-analysis concluded that the presence of diabetes doubles the odds of comorbid depression and the prevalence of comorbid depression among people with diabetes was 11%. Estimates of depression prevalence among people with diabetes appear to vary by diabetes type and between lower and higher income countries, although the evidence base for lower income countries is much smaller than that for HICs [14]. A study in 2007 concluded that 9.3% of people with depression had diabetes [16].

The frequent co morbidity of depression and diabetes is a blatant example of the increasing comorbidity of mental and physical disorders in recent years. Unfortunately, the increasing frequency of comorbidity and the projections of its epidemic growth are not matched by an appropriate response of governments, health services or educational institutions. Quality of life (QOL) refers to the ways in which health, illness, and medical treatment influence an individual's perception of functioning and well-being [3, 6]. QOL has been recognized as a domain of major importance in patients with chronic diseases, including DM. It is regarded as a major outcome that should be taken into account when evaluating the goals and effectiveness of any therapeutic plan [6]. Several studies have shown that QOL in diabetes is decreased as compared to individuals without diabetes. Depression is known to have a considerable impact on QOL.

Rapaport *et al.;* in his study found that the quality of life impairment was 63% [10] and this corroborates our finding, 66% depressed individuals had impaired quality of life. Pyne *et al.;* in their study also found much poorer quality of life in depressed patients associated with more profound and global impairments [17]. Schonfeld *et al.;* in their study similarly found much greater quality of life impairment and negative impact compared to other psychiatric disorders [18]. Olfson M *et al.;* in their study also found greater quality of life impairment like our study and supports our findings [19]. Depression is known to have a considerable impact on QOL, Ali *et al.;* conducted a systematic literature review as well, including 14 cross-sectional studies, and concluded that depression had a significant negative impact on QOL of patients with DM [8]. Depression may thus be an important determinant of QOL in diabetes [5].

CONCLUSIONS:

The study found a greater degree of quality of life impairment in depressed patients. The Quality of life Impairment was significantly more for depressed patients who had co-morbid Diabetes Mellitus. Regimens to achieve better diabetes control and address depression may elate overall Quality of life in people with co-occurring depression with Diabetes.

Compliance with Ethical Standards:

Conflict of Interest: Authors declare no conflict of interest or any funding source received for this study

Ethical approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in the study.

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