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Frequency and Correlates of Depression in Hemodialysis Patients versus Apparently Healthy Population in Egypt

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Abstract

Background: Depression is the most common mental health condition in the general population. Additionally, depression is common in hemodialysis patients and is associated with a lower quality of life. The social causes of depression have been ignored for a long time. We aimed to assess the severity and correlates of depression in HD patients and compare them to a group of apparently healthy individuals in Egypt.

Methods and Subjects: The study was conducted in four dialysis units in Egypt where 234 patients and 242 healthy individuals were recruited. The depression scoring, demographic data, and associated comorbidities were recorded. Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D), NIMH. The higher scores indicated the presence of more symptomatology.

Results: The total studied groups were 234(136 males, 98 females) patients on dialysis with a mean age of 55.6±13.6 years (range 21–79 years), and 242(157 males, 85 females) healthy individuals with a mean age of 33.6±13.3 years (range 18–70 years). Females both in dialysis patients as well as in the controls had statistically significantly higher depression scores indicating more depressive symptoms, than their male counterparts. Depression scores were significantly negatively correlated with the ages of control individuals, while they had non-significant positive correlations with ages and BMIs in cases. More depressive symptoms were associated with better socioeconomic status and higher education in the control group, although depressive symptoms increased with lower socioeconomic status and lower level of education in HD patients. In HD patients, the severity of depressive symptoms was significantly related to the presence of diabetes mellitus and ischemic heart disease. On the other hand, the more depressive symptoms in HD patients without associated comorbidities were not statistically significantly different from that in the apparently healthy group.

Conclusion: The severity of depressive symptoms was different demographically between hemodialysis patients and the apparently healthy individuals, and was more pronounced in patients with more advanced age, lower socioeconomic status, and lower education, necessitating more consideration of social and psychological care for these patients.

Keywords: Depression; Hemodialysis Patients

Abbreviations: ESRD: End-Stage Renal Disease; CES-D: Center for Epidemiologic Studies Depression Scale; SPSS: Statistical Package of Social Science.

Introduction

Depression is the most common mental health condition in the general population [1,2], characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration [3]. In its most severe form, depression can lead to suicide [4,5] and increased risk of mortality [6]. Depression frequently takes a chronic course and considerably weakens the possibility of an individual's occupation [7] and quality of life [8,9]. Depression could be dependably diagnosed and treated by primary health physicians [10,11].

Depression is a common mental health problem worldwide in the past two decades during the era of the development of the Internet and online health information. Furthermore, depression is described to be one of the most common psychological conditions among hemodialysis patients [12]. The prevalence of depression was found to be dissimilar in the various communities, 34.5% in a tertiary hospital among hemodialysis patients in Nigeria [13] compared to a prevalence of 27% among African American hemodialysis patients [14]. However, it is 72% among end-stage renal disease (ESRD) patients in Sudan [15]. The risk factors for depression among ESRD patients include low compliance to medications, poor nutritional status, and marital problems [16], connections to the hemodialysis machine for three hours per session with a minimum of three sessions per week [17]. Socio-demographic variables such as age and family support have been reported to show a significant role in the psychological well-being of hemodialysis patients [18]. Patients with varying dialysis duration reported differences in the prevalence of depression [19]. In a previous study of our group; it was reported that depression determinants in Egyptian hemodialysis patients were female gender, diabetes mellitus, IHD, malnutrition, and lower serum albumin and blood hemoglobin [20]. The latter study stimulated us to compare the difference in the determinants and correlates of depression between hemodialysis patients and the apparently healthy control group in relation to socioeconomic status, education level, employment status, and other demographic and associated comorbidities of the studied group.

Aim of the Work

We aimed to assess the severity and correlates of depression in HD patients and compare them to a group of apparently healthy individuals in Egypt.

Material and Methods

The study was conducted in four renal dialysis units in Dakahalia governorate in Egypt where 234 hemodialysis patients and 242 apparently healthy controls were recruited for the study. The demographic data, socioeconomic status, education level, employment status, associated comorbidities, and depression scoring of all the cases and apparently healthy control groups were reported. The patients with known CKD or maintained on dialysis were not included in the control group.

Depression was measured using the Center for Epidemiologic Studies Depression Scale (CES-D), NIMH. Depression scoring design is clarified as the following, zero for answers in the first column, 1 for answers in the second column, 2 for answers in the third column, and 3 for answers in the fourth column. The scoring of positive items is reversed. The possible range of depression scores is zero to 60, with the higher scores indicating the presence of more symptomatology. The used depressive score scale put higher stress on related mood symptoms referred to as depressive mood rather than physical symptoms to avoid the possible overlap with the medical conditions.

Statistical Analysis

After the collection, the data were analyzed using the statistical package of social science (SPSS, IBM) software version 24. Categorical data were expressed as numbers and percentages and were analyzed by the Chi-square test or Mcnemar test as appropriate. Normality was tested using Shapiro Wilkinson or Kolmogorov-Simiranov tests, as appropriate. Scale data were expressed as means ± SD or medians (IQ) as appropriate. Parametric data were analyzed using T-test, one-way ANOVA, and Pearson correlation, while Man-Whitney; Kruskal-Wallis, or spearman correlation tests were used to analyze non-parametric data. The P-value was considered significant if it was & lt; 0.05.

Results

The total studied groups were 234(136 males, 98 females) patients on dialysis with a mean age of 55.6±13.6 years (range 21–79 years), and 242(157 males, 85 females) healthy individuals with a mean age of 33.6±13.3 years (range 18–70 years) (Table 1). Table 1 showed demographic data and depression scores in both studied groups where there was a nearly significant higher depressive score in hemodialysis patients. While, table 2 showed the distribution of gender, associated comorbidities, socioeconomic status, and education level in both studied groups: There were

higher frequencies of associated comorbidities (diabetes, hypertension, and ischemic heart disease) in the dialysis group. Additionally, there were higher frequencies of poor socioeconomic status, and illiteracy (Table 2) as well as more number of unemployed personnel in HD patients (Table 3) Table 4 showed the distribution of depression scores in relation to employment status in both groups; there was higher depression score in mental employee in the control group. However, it was higher in unemployed persons in HD patients yet, the depression score was the least in mental employees on hemodialysis.

The severity of depression was significantly positively correlated with younger age, higher socioeconomic status, and a higher level of education in the control group (Tables 5 & 6) while Tables 7 & 8 showed associations of depression score with different variables in the cases group where Depression scores were positively correlated with older age, higher body mass index, lower socioeconomic status and lower level of education in HD patients. Females both in dialysis patients as well as in the controls had statistically significantly higher depression scores indicating more depressive symptoms, than their male counterparts. In HD patients, the severity of depressive symptoms was significantly related to the presence of diabetes mellitus and ischemic heart disease. Comparisons of the distribution of depression scores between control and cases were shown in Table 9. There was no statistically significant difference in the severity of depression distribution between both groups even, after the exclusion of associated comorbidities (Table 10).

	Gp	N	Mean	Std. Deviation	
Age	Control	242	33.5579	13.298	t=0.661
	Cases	234	55.6325	13.64611	p<0.001*
Body mass index	Control	239	26.7829	4.46104	t=2.94
	Cases	234	28.2405	6.1907	p=0.003*
Depression Score	Control	242	16.1694	11.19166	t=1.91
	Cases	234	18.2308	12.29598	p=0.056

Table 1: Demographic data and depression score in both studied group.

	Control N=242(%)	Cases N=234(%)	
Sex			
Female	85(35.1)	98(41.9)	P=0.130
Male	157(64.9)	136(58.1)	
Diabetes mellitus	11(4.5)	86(36.8)	
Hypertension	9(3.7)	162(69.2)	
Ischemic heart disease	2(0.8)	39(16.7)	
Socioeconomic status			
Poor	30(12.4)	57(24.4)	P=0.003*
Average	126(52.1)	111(47.4)	
Above average	86(35.5)	66(28.2)	
Education Level			P<0.001*
Illiterate	38(15.7)	91(38.9)	
Secondary school and below	94(38.8)	102(43.6)	
Above secondary school	110(45.5)	41(17.5)	

Table 2: Distribution of gender, associated comorbidities, and socioeconomic status and education level in both studied group.

			Control Group	Cases	
Employment	Individuals with No work	n	36	166	Mc
		%	14.90%	70.90%	
	Individuals with Physical work	n	102	32	
		%	42.10%	13.70%	P<0.001
	Individuals with Mental work	n	104	36	
		%	43.00%	15.40%	
Total		n	242	234	476
		%	100.00%	100.00%	100.00%

Table 3: Distribution of employment status in both groups.

Depression score					
Employment status		N	Mean	Std. Deviation	
Control group	Individuals with no work	36	14	7.86851	P<0.001*
	Individuals with Physical work	102	12	8.7868	
	Individuals with Mental work	104	21	12.30395	
	Total	242	16	11.19166	
CASES	No work	166	20	12.64632	P<0.001*
	Physical work	32	16	10.8954	
	Mental work	36	12	8.98831	
	Total	234	18	12.29598	

Table 4: Depression scores in both groups in relation to employment status.

Among control group		Depression score
Age	Rs	-.263**
	P	<.001
Body mass index	Rs	.069
	p	.289
Socioeconomic status	rs	.157*
	p	.014
Education level	rs	.288**
	p	<.001

Table 5: Correlations of depression score with different variables in the control group.

Among control group	Total number	Depression score Median (IQR)	Test of sig.
Sex			
Female	85	17(10-26)	P=0.004*
Male	157	14(6-20)	
Diabetes mellites			P=0.273
-ve	231	15(8-21)	
+ve	11	16(11-25)	
Hypertension			P=0.572
-ve	233	15(8-22)	
+ve	9	15(5-18.5)	
Ischemic heart disease No			P=0.402
Yes	240	15(8-22)	
	2	20.5(15-26)	

Table 6: Associations of depression score with different variables in the control group.

Among cases		Depression score
Age	r	0.093
	p	0.155
Body mass index	r	0.063
	p	0.341
Socioeconomic status	r	-0.09
	p	0.169
Education level	r	-.141*
	p	0.031

Table 7: Correlations of depression score with different variables in the cases group.

Among cases	Total number	Depression score Median(IQR)	Test of sig.
Sex			P=0.003*
Female	98	20(10-30)	
Male	136	12.5(7.25-23)	
Diabetes mellites			P=0.024*
No	148	13(8-26.75)	
Yes	86	18(10.75-29.25)	
Hypertension			P=0.211
No	72	12(6.25-28)	
Yes	162	15(9-27)	
Ischemic heart disease No			P=0.054
No	195	14(8-27)	
Yes	39	21(9-33)	

Table 8: Associations of depression score with different variables in the cases group.

Depression score	Control group N=242(%)	Cases group N=234(%)	Test of Significance
<20	169(69.8)	141(60.3)	P=0.02*
Depression score	10.35±5.82	9.69±4.74	P=0.281
20-40 Depression score	65(26.9)	80(34.2)	P=0.08
	27.40±6.07	28.55±5.06	P=0.216
>40	8(3.3)	13(5.6)	P=0.232
Depression score	47.75±5.77	47.31±4.73	P=0.85

Table 9: Comparison of depression scores between control and cases in the total groups.

Depression score after exclusion of comorbidities	Control group N=222(%)	Cases group N=61(%)	Test of significance
<20	156(70.3)	36(59.0)	P=0.09
Depression score	10.27±5.93	8.94±4.6	P=0.202
20-40	58(26.1)	24(39.3)	P=0.003*
Depression score	27.74±6.27	29.13±4.52	P=0.156
>40	8(3.6)	1(1.6)	P=0.438
Depression score	47.75±5.78	41±0	P=0.172

Table 10: Comparison of depression scores between control and cases after exclusion of comorbidities.

Discussion

Depression is the most common mental health condition in the general population, characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration. In a previous report of our group about depression determinants in Egyptian hemodialysis patients conveyed that depression in dialysis patients is associated with female gender, diabetes mellitus, IHD, malnutrition, and lower serum albumin and blood hemoglobin [20]. This report guided us to compare the severity and correlates of depression in hemodialysis patients versus a control group and to analyze the relationship between socioeconomic status, education level, employment status, and other demographic factors and associated comorbidities in the hemodialysis patients as well as the control group. In this research, we aimed to assess the severity and correlates of depression in HD patients and compare them to a group of apparently healthy individuals in Egypt.

In the present work, there were higher frequencies of poor socioeconomic status, illiteracy, and unemployment in the group of cases than in the control one. This could be clarified by less orientation of the risk factors, diagnosis, and management of chronic kidney disease in illiteracy and poor socioeconomic status. Additionally, dialysis could result in an increased frequency of unemployment status due to loss of job especially if the original work of the patient is physical work that could be greatly affected by the dialysis determining factors and individual physical health. There were higher frequencies of associated comorbidities (diabetes, hypertension, and ischemic heart disease) in the dialysis group than the frequencies in the control group in the present study. This is could be explained by the presence of diabetes, hypertension, and ischemic heart disease acting as risk factors for the development and progression of CKD.

In this study, the depressive scores were higher in HD patients than those of the apparently healthy group. This could be explained by the loss of jobs in dialysis, the low self-esteem of the patients, and due to the persistent needs of the patients for the dialysis machine. This observation is shared by Karamanidou, et al. [17] who explained that the connection of the patients to the hemodialysis machine for three hours per session with a minimum of three sessions per week could be related to increased depression in hemodialysis patients [17]. Additionally, Turkistani, et al. [18] clarified that socio-demographic variables such as age and family support could play a significant role in the psychological well-being of hemodialysis patients. The impact of the loss of a job and low level of income as well as the older age of the patients on the occurrence of depressive symptoms has been confirmed in many previous publications [18,21,22].

In this work, the average depression score was higher in mental workers, younger individuals, those coming from higher socioeconomic status, and those having a higher level

of education in the control group. On the other hand, in dialysis patients, higher depression score is observed more with non –employment, older age, lower socioeconomic status, and lower level of education. Moreover, the least depression score was in mental employees in dialysis patients. It is easily conceivable that hemodialysis patients have less ability to do physical activity, thus, they are inclined toward mental jobs with less effort and more satisfaction. This concept is shared by many previous publications that reported a high prevalence of depressive symptoms in HD patients with unemployment, and lower socioeconomic status [21,22]. In the same context, Park, et al. [23] found that depression in HD patients was more in old age (>60 years), with low hemoglobin level (<10 g/dl), and low economic status, and old age was the most important risk factor among them. In addition, female gender, presence of diabetes mellitus, and high CRP (>0.5 mg/dl) were common factors associated with decreased health-related quality of life and depression [23].

In our work, there is a higher depression score in the female gender in both the CKD patients and control groups. This is supported by Puri and his associates who reported that the prevalence of depressive symptoms in women is known to be twice as high as in men in the general population [24]. The same trend was also reported by Park HC [23]. Furthermore, there are gender differences in the prediction of lethality in suicide attempts among people suffering from severe depression, more in females [25].

.In this work, the frequency of depression was higher in patients with diabetes mellitus and ischemic heart disease. This finding is reinforced by many publications that found a strong association between depression and cardiovascular risk [26,27]. Additionally, depression and metabolic syndrome are positively correlated and act as independent predictors of adverse cardiac outcomes [28,29]. Moreover, depression frequency is higher among HD patients with diabetes, [23] and depression is correlated with poor glycemic control [28]. After controlling for the associated comorbidities, the frequency of depressive symptoms was comparable between the HD patients and the apparently healthy group in the present work.

Limitations

An important limitation of this study was that all the interviews and questionnaire filling of the dialysis patients were undertaken while they were having their dialysis therapy with the patients attached to the dialysis machines. Hemodialysis sessions might be associated with some physical manifestations that could lead to temporary dissatisfaction which is expected to have a potentially detrimental effect on the way the patients fill out the questionnaire form, thus, possibly deviating the depression scores.

Conclusion

The frequency of depressive symptoms was demographically higher in hemodialysis patients compared to the apparently healthy individuals and was more pronounced in patients with more advanced age, lower socioeconomic status, non-employment condition, and lower education level. This necessitates more consideration of the level of social and psychological care offered to these patients.

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