

Original Article

Screening of depression in chronic kidney disease patients undergoing haemodialysis.

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Abstract

Background: Depression is a common psychiatric disorder among chronic kidney disease (CKD) patients, and it has affected the morbidity & mortality rate of CKD patients. This study aims to determine the frequency and severity of depression in CKD patients on hemodialysis.

Methodology: This cross-sectional study was conducted at the Department of Nephrology, Abbasi Shaheed Hospital, Karachi. A total of 251 patients of age between 18-60 years admitted with End-Stage Renal Disease ESRD and getting maintenance haemodialysis were included. Patients diagnosed with psychiatric, neurological illnesses and taking antidepressants were excluded from the study. Demographic and clinical characteristics of CKD patients were obtained on the structured questionnaire, and the Hospital Anxiety and Depression Scale (HADS) was utilized.

Results: Of the total, 127 (50.6%) were males, and 124 (49.4%) were females, with a mean age of 53.94 ± 14.67 years. Approximately 65% of ESRD patients were suffering from depression. Among these, the patients who were receiving maintenance dialysis were suffering from a mild form of depression (33.1%) (HADS 5-9), 22.3% had moderate depression (HADS 10-14), and 9.6% had severe depression (HADS >15). Moreover, a significant difference has been observed between age and creatinine levels.

Conclusion: Around 10% of the patients had severe depression, which enhances the attention towards it. Multicenter studies should be conducted across Pakistan to identify the extent of the problem.

Keywords

Chronic Kidney Disease, Depression, End-Stage Renal Disease, Hospital Anxiety & Depression Scale-HADS.



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Introduction

Globally, Chronic Kidney Disease (CKD) stand out as a significant public health problem¹. The prevalence and incidence continue to spread progressively in the world. Because CKD is a progressive illness, its triggering factors include biological, psychological and social factors affecting patients at any point in time²⁻⁵. The estimated prevalence of CKD is 14.9%, 18.7%, 13.8% in countries including Iran, Japan, and Thailand, respectively, whereas, in Pakistan, it is 29.9%⁶. The all-age mortality rate from CKD enhanced 41.5% between 1990 and 2017 across the globe. However, the global prevalence of 9.1% was recorded in all-stage CKD; since 1990 was increased up to 29.3%⁷. The hospital anxiety and depression scale (HADS) was first introduced by Zigmond and Snaith⁸. Some of the globally accepted measures of depression are Structured Clinical Interview (SCID) for DSM-IV, Beck Depression Inventory (BDI), Kidney Disease Quality of Life Short Form (KDQOL-SF)⁹, and the Hospital Anxiety and Depression Scale (HADS)¹⁰. We have used HADS for this study. The purpose of this scale was to provide healthcare practitioners a reliable and easy way to identify vulnerable patients to acquire depression and anxiety⁸.

Jafer et al. reported that the glomerular filtration rate (GFR) had been decreased approximately 15-20% of people older than 40 years of age¹¹. Guo X et al., found that moderate or greater depression level increases the risk for developing low GFR in hypertension (HTN) patients¹². Another study conducted at Shalimar hospital and Sheikh Zayed Hospital, Lahore from January 2006 to July 2010 had concluded that a considerable number of their patients undergoing hemodialysis were anxious and depressed along with being married, illiterate and poor socioeconomic status as major risk factors^{8,13}.

Association of depression is common with chronic diseases such as diabetes mellitus, coronary artery disease, cardiovascular accident carcinomas, and vasculitis⁵. This factually explains the incidence of depression in CKD patients^{14,15}. Dietary restriction leads to a high prevalence of depression in CKD patients. Other factors influencing the prevalence

of depression include co-morbid conditions, restricted activities, social restrictions and fear of undergoing surgical procedures^{11,16}.

Unfortunately, our local data on this domain is very scarce. Therefore, this study was conducted in our center to determine the frequency and severity of depression in patients with CKD. It is very important to detect and treat depression in CKD patients because it decreases the quality of life and increases hospitalization rate, risk of suicidal attempt and mortality and morbidity¹⁴. It is predicted that CKD prevalence will almost increase by 100% within the next 10 years. Thus, by appreciating the long-term effects of depression on the quality of life for patients with CKD, it might be possible to implement therapies that can help to reduce the severity of these symptoms¹⁷. HADS is used to assess the prevalence of depression in CKD patients who are dialysis-dependent. Other factors, including lower socioeconomic status, lack of educational facilities among CKD patients undergoing hemodialysis, have also been considered under this study.

Methodology

This cross-sectional study was conducted at the Department of Nephrology, Abbasi Shaheed Hospital, Karachi. A total of 251 patients aged between 18-60 years admitted at Nephrology ward from March 2020 to August 2020, with End-Stage Renal Disease ESRD and getting maintenance hemodialysis were included. Patients diagnosed with psychiatric, neurological illnesses and taking antidepressants were excluded from the study.

Informed consent was obtained from all the patients and the project was approved by the Ethical Institutional Review Board (BUMDC 25/2020) of Bahria University, Medical and Dental College, Karachi.

Open epi software was used for sample size calculation, keeping a margin of error 5%, a confidence interval of 95%, and the power of the study was 80%. Calculated total sample size was 251 for this study.

The study's principal investigator helped the low-literacy patients complete the HADS questionnaire as they were unable to do it independently. The patients were categorized according to the number of points they score in HADS.

The researchers used SPSS Version 20.0 to enter, and process the study data. The Kolmogorov-Smirnov test was used to check for the normal distribution of the data. Continuous variables like age, weight, duration of disease, serum creatinine, estimated GFR were presented as mean \pm SD. In contrast to this, categorical variables like gender, CKD etiology, and depression severity were reported as frequency and percentages. Chi-square tests were used for the difference in proportion between the variables, and the Kruskal-Wallis test was applied for significance. P-value \leq 0.05 was considered significant.

Results

A total of 251 cases were included in this study. The mean age of the patients was 53.94 ± 14.67 years. There was a male majority in the study, as evident by a male to female ratio 127 (50.6%) / 124 (49.4%). After the evaluation of the patients it was determined that almost 65% of ESRD patients were suffering from depression, particularly those who were on maintenance dialysis treatment. Mild depression was found in (33.1%) (HADS 5-9), 22.3% had moderate depression (HADS 10-14) and 9.6% had severe depression (HADS >15). The main etiology of ESRD was HTN 155(62%) followed by Diabetes mellitus 113(45%), stone 40(16%), GN 20(8%), and others 14(5.6%), respectively. (Table:1)

Table 1: Demographic and clinical characteristics of CKD patients.

Clinical Parameters		(n=251)
Age (years)		53.94 \pm 14.67
Duration of disease (month)		29.06 \pm 22.87
Creatinine (gm/dl)		4.48 \pm 1.986
Gender	Male	127(50.6%)
	Female	124(49.4%)
Depression	Yes	163(64.9%)
	No	88(35.1%)
Severity Depression	Mild	83(33.1%)
	Moderate	56(22.3%)
	Not found	88(35.1%)
	Severe	24(9.6%)
Etiology of ESRD	Hypertension	155(62%)
	Diabetes Mellitus	113(45%)
	Stone	40(16%)
	Glomerulonephritis	20(8%)
	Others	14(5.6%)

*ESRD- End-Stage Renal Disease

Of the total, it seems that the duration of the disease did not significantly influence the occurrence of depression ($p > 0.05$). However, females were significantly more depressed as compared to males ($p < 0.001$). Moreover, people aged > 30 years were more depressed as compared to those < 30 years of age ($p < 0.001$). Significant difference has been found between age ($p < 0.001$), creatinine ($p < 0.001$) and Creatinine clearance (CRCl) ($p < 0.001$) regarding the severity of depression among haemodialysis disease patients.

Table 2: Effect of Baseline parameters on HADS scale

Variables	Severity			p-value
	Mild	Moderate	Severe	
Mean Age (years)	48.67±15.44	55.89±14.0	64.42±14.86	<0.001
Age Groups	≤30	15(71.4)	3(14.3)	<0.001
	>30	68(29.6)	53(23)	
Gender	Female	60(48.4)	12(9)	<0.001
	Male	23(18.3)	44(34.9)	
Duration of Disease (months)	26.40±22.09	28.63±23.34	35.33±24.98	0.370
Disease duration categories	≤50	74(34.1)	50(23)	0.295
	>50	9(26.5)	6(17.6)	
	>20	65(31.7)	43(21)	
Creatinine	3.57±1.08	5.33±1.35	8.25±1.69	<0.001
Creatinine clearance	19.55±6.38	14.21±2.46	6.42±1.64	<0.01

Discussion

Chronic kidney disease (CKD) constitutes a widely spreading global health concern, along with ESRD. This is a concerning issue in developing countries since it results in serious negative effects on the individual and their productivity^{1,2,8,9,18}. It was observed that when hemodialysis therapy begins, the patient undergoes high levels of physical and mental stress^{8,18,19}. It is likely for the patient to experience heightened levels of depression and anxiety due to difficulties in balancing many pressures, ranging from financial burdens, workloads, family pressures, and daily expenses^{8,18,19}.

The dialysis procedure requires a lot of time, which can be a source of psychological disturbance, leading to high levels of anxiety and depression. Depression is the most reported psychological problem in patients undergoing hemodialysis^{8,20}. The effects of depression may vary from patient to patient depending on the medical facility and the country they are living in, leading to considerable diversity in how it is recorded and manifested. Several studies were reviewed before conducting this research project. These studies provided statistics about depression and anxiety observed at dialysis facilities in different countries. A strong correlation was found between immune dysfunction and depression. Patients undergoing

maintenance hemodialysis experience a drop of serum albumin before the onset of depression, often leading to hospitalization⁸. According to Kimmel et al., such patients have an 18-23% relative risk of death. According to United States Renal Data System (USRDS) ESRD patients have an elevated tendency to attempt suicide⁸.

The CKD is also a common diabetic-related complication among type 2 diabetic mellitus (T2DM) patients. We found that Diabetic nephropathy is the main etiological factor in the present study for renal failure in 45% of the cases, followed by stones (16%) and chronic glomerulonephritis in 8% of the cases. Wuerth et al., had reported diabetic nephropathy as the major reason for kidney failure and ESRD (36%)²¹. In one study carried out with urban African-American patients in 2007, showed one-fifth of the participants to have major depression, whereas another 9% suffered from dysthymia. Almost more than a quarter of the participants had anxiety disorder⁹.

On the contrary, in this study HADS scale analysis showed nearly 65% of ESRD patients to have depression. Of these, 33% had mild depression, while 22% suffered from moderate levels of depression. Less than 10% of the patients suffered from severe depression. In a related study carried

out in Taiwan, 35% of hemodialysis patients reported the symptoms of depression, and another 21% experienced suicidal thoughts. Another study reported similar result like 22(14.9%) mild, 14(9.5%) moderate, and 7(4.7%) had severe symptoms^{2,22}. In another study by Kutner et al., the prevalence of depression was 26.6%. Similarly, Cukor et al. reported depression in 29% of patients with ESRD^{8,9}. In Sarajevo, a study was conducted with 200 patients on hemodialysis, which showed 30% of the participants reporting mild depression, 8.5% of the people with moderate depression, and 12.5% with severe forms of depression. Almost 60% of these patients were male, and a vast majority (84%) had a poor socioeconomic background²³. Another study that was done during the COVID-19 pandemic reported that 42.7% of Turkish and 72.7% of the Syrian population is suffering from depression²⁴. Another study reported 68% depressive symptoms among dialysis patients²⁵.

As the sample was limited only to the patients from Abbasi Shaheed Hospital, Karachi thus, we suggest more investigations, preferably with larger sample size must be conducted, to further testify the present findings.

Conclusion

It has been found that depression is a common psychological issue reported by patients on hemodialysis. Several social and environmental factors may contribute to the incidence of depression in ESRD patients. Multicenter studies should be conducted across Pakistan to identify the extent of the problem.

Conflicts of Interest

The authors have declared that no competing interests exist.

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