Original Research Article

Prevalence of Anxiety and Depression in Patients on Maintenance Hemodialysis for Chronic Kidney Disease

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Abstract:

Background: Anxiety and depression, are prevalent among patients with chronic kidney disease (CKD) who are on maintenance hemodialysis and affect their quality of life. Anxiety and/or depressive symptoms among these patients have been found associated with duration of their illness.

Methods: This is a cross-sectional study. A total of 75 patients with CKD and on hemodialysis at Adesh Medical College and Hospital, Shahabad, are included in the study during the period from February 2023 to April 2023. Data is collected using the Hospital Anxiety and Depression Scale questionnaire. Sociodemographic information, duration of illness, co-morbidities and compliance to hemodialysis is determined.

Results: Of the 75 CKD patients, 34.7% has depression and 24% has anxiety symptoms. 61.3% of the participants are males and 38.7% are females. In this study, the mean age (in years) is 49.48 years. It is also found that only duration of chronic kidney disease has reached statistical significance and is independently associated with anxiety and depression among the participants (p value = 0.014).

Conclusions: Anxiety and depression are prevalent among CKD patients, particularly among males and older patients. Thus, the present study will help in establishing a screening program to determine anxiety and depression in patients who are at risk. In addition, preventive measures should be implemented to avoid the occurrence of depression and anxiety so that patients' quality of life must be improved.

Keywords: Chronic Kidney Disease, Depression and Anxiety, Hemodialysis, End Stage Kidney Disease.

Introduction

Chronic kidney disease (CKD) is defined as kidney damage for ≥3 months, as defined by structural or functional abnormalities of the kidney, with or without decreased GFR. CKD has been divided into five stages on the basis of the eGFR and albuminuria as indicated in the table underneath.[1]

Prognosis of CKD by GFR and albuminuria category

Prognosis of CKD by GFR and albuminuria categories: KDIGO 2012

				Persistent albuminuria categories, description and range		
				A1	**A2**	**A3**
				Normal to mildly increased	Moderately increased	Severely increased
				<30 mg/g <3 mg/mmol	30–300 mg/g 3–30 mg/mmol	>300 mg/g >30 mg/mmol
GFR categories (ml/min/1.73 m²), description and range	G1	Normal or high	≥90	green	yellow	orange
	G2	Mildly decreased	60–89	green	yellow	orange
	G3a	Mildly to moderately decreased	45–59	yellow	orange	red
	G3b	Moderately to severely decreased	30–44	orange	red	red
	G4	Severely decreased	15–29	red	red	red
	G5	Kidney failure	<15	red	red	red

green, low risk (if no other markers of kidney disease, no CKD); yellow, moderately increased risk; orange, high risk; red, very high risk.

Chronic kidney disease (CKD) is considered a leading public health problem all over the globe. The estimated prevalence of CKD is 13.4% (11.7-15.1%) at the global level, and patients with end-stage kidney disease (ESKD) needing renal replacement therapy is estimated between 4.902 and 7.083 million. [2] In India, the prevalence of chronic kidney disease is 17.2% with stage 1, 2, 3, 4, 5 as 7%, 4.3%, 4.3%, 0.8% and 0.8% respectively.[3]

The main causes of CKD are diabetes and hypertension in all high-income and middle-income countries, and also in many low-income countries. Incidence, prevalence and progression of CKD also vary within countries by ethnicity and social determinants of health, possibly through epigenetic influence.[4] In western countries, diabetes and hypertension account for over 2/3rd of the cases of CKD.[5] In India too, diabetes and hypertension today account for 40–60% cases of CKD.[6]

The supportive educational or lifestyle considerations and symptomatic interventional measures make a positive difference to people living with chronic kidney disease. Non-availability or inequality in services for this disease disproportionally affects disadvantaged populations, and healthcare service provision to incentivize early intervention over provision of care only for advanced chronic kidney disease is still evolving in many countries[7]. Since the confirmation of diagnosis, chronic kidney disease patients need to be treated for the rest of their lives; but, generally the emotional and psychological aspects of the patients' disease are overlooked by the healthcare service providers. Depression is an important aspect that must be addressed carefully by the healthcare professionals. Depression is an emotional state characterized by somatic and cognitive symptoms including feelings of sadness, worthlessness, sleeplessness, loss of appetite and sexual desires, and interest in

usual activities.[8] Anxiety is another commonly co-occurring psychopathology with CKD/ESRD. Anxiety is such an emotional state in which the individual experiences intense fear, uncertainty, and dread from the anticipation of a threatening situation.

Several studies confirm a high prevalence of depression and anxiety among patients with chronic kidney disease. The prevalence of anxiety, depression and insomnia were found to be 71%, 69% and 86.5% respectively.[9] Depression can be affected by some socio demographic factors as well as by individual general condition, and its association with suicide, fatigue, sleep disorder and pain in ESRD patients.[10] Studies have reported an association of depression with kidney function decline.[11] As the chronic kidney disease stage advances, the prevalence as well as severity of these parameters also increase. Depression, anxiety, and sleep quality were found to be significantly correlated to several factors like unemployment, low income, low education, urban residence and presence of co-morbidities. Some study has proved that the depression, anxiety, and insomnia scores were found to have a strong negative correlation with eGFR, hemoglobin, serum calcium ($p < 0.01$) and a positive correlation with TLC, blood urea, serum creatinine and serum phosphate ($p < 0.05$).[9] Additionally, CKD patients on dialysis are more likely to develop depression (34.5%) compared with patients not on dialysis (13.3%).[12]

The aim of this study is to determine the prevalence of anxiety and depression among CKD patients undergoing hemodialysis in a tertiary hospital in North India. Thus, the findings of this study will serve as a basis to initiate a needs assessment among CKD patients experiencing anxiety and depression and to develop and implement a support management plan to improve mental health services for these CKD patients and improve their quality of life.

Methodology

This is a cross-sectional study conducted on the patients with chronic kidney disease on maintenance hemodialysis at Adesh medical college and hospital, Shahabad from 15 February 2023 to 15 April 2023.

Objectives

- To find out the prevalence of anxiety and depression in the patients of chronic kidney disease on maintenance hemodialysis.
- To find out the most common contributing factor affecting the mental health of the patient undergoing regular maintenance hemodialysis.

Inclusion criteria

- All CKD patients on regular maintenance hemodialysis.
- Age < 60 years
- Patient giving consent to be included in the study.

Exclusion criteria

- Age >60 years
- Patients with prior psychiatric illness or cognitive dysfunction
- Drug abusers
- Transplant patients
- Cancer patients
- Pregnant females

Data collection

Convenience sampling method is employed and a standardized patient proforma is maintained in which patient's certain details are noted. Patients are asked to fill out the HAD questionnaire for depression and anxiety. The primary outcome of this study is to estimate the prevalence of depression and anxiety among CKD patients who are undergoing hemodialysis and to find out the most common contributing factor affecting the mental health of the patient.

According to the HADS questionnaire, individuals with a score of 7 or below are

considered to be normal, individuals with a score of 8-10 are considered to be on the borderline of depression and anxiety, and individuals with a score of 11-21 are considered to be depressed and have anxiety. The data was collected and analyzed statistically.

Data analysis: The data collected is then entered into MS Excel sheet and processed using IBM SPSS version 27. Continuous variables were expressed as mean including the standard deviation and categorical data is presented as frequencies and percentages and represented in tables and figures wherever necessary.

Results

Socio demographic characteristics of the participants: A total of 75 CKD patients are recruited to participate in the study. Table 1 shows that 61.3% of the participants are males and 38.7% are females. Regarding their education, 29.3% of the patients are illiterate, 28% had completed high-school education, and 14.7% held a university degree.

More than half of the participants (69.3%) are unemployed and unskilled workers. In this study, the mean age (in years) is 49.48 years. For majority of patients (54.7%), duration of illness lies between 1 to 5 years.

Table 1: Sociodemographic and clinical profile of study participants (N=75):

Variables	Frequency	Percent
Age (Mean±SD)	49.48±14.5 years	
Age:		
18-40 years	23	30.7
41-60 years	33	44.0
>60 years	19	25.3
Gender:		
Female	29	38.7
Male	46	61.3
Occupation		
Ex-service man	3	4.0
Housewife/unemployed	30	40.0
Professional	10	13.3
Skilled worker	10	13.3
Unskilled worker	22	29.3
Married	72	96.0
Unmarried	3	4.0
Education		
Illiterate	22	29.3
Upto 8th	6	8.0
Upto 10th	21	28.0
Upto 12th	15	20.0
Graduate and above	11	14.7
Family type		
Joint	36	48.0
Nuclear	39	52.0
Comorbidities		
Hypertension	63	84.0
Diabetes	19	25.3
Others	17	22.7
Duration of disease		

≤ 1 year	26	34.7
1-5 years	41	54.7
>5 years	8	10.7

Prevalence of anxiety and depression among CKD patients on hemodialysis. Among 75 participants, 30 (40%) of the participants are not experiencing depression, 19 (25.3%) are considered borderline, and only 26 (34.7%) showed symptoms of depression and whereas anxiety is considered 37(49.3%) of the patients are not experiencing anxiety, 20 (26.7%) are considered borderline, and only 18 (24%) showed symptoms of anxiety (Table 2).

Table 2: Prevalence of depression and anxiety based on HADS score:

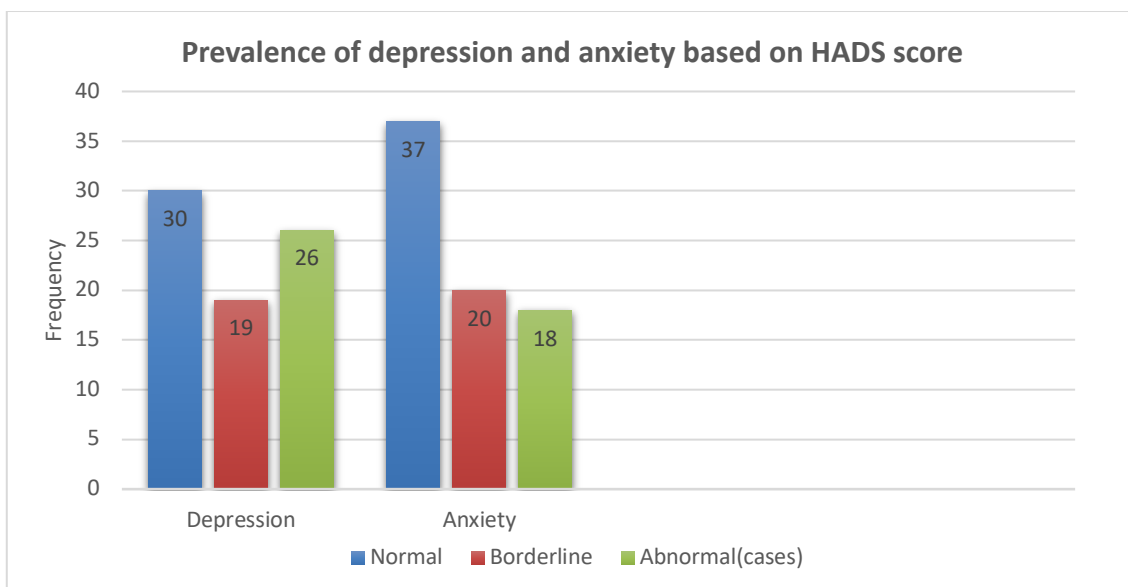| Depression	Frequency	Percent
Normal	30	40.0
Borderline	19	25.3
Cases	26	34.7
Anxiety		
Normal	37	49.3
Borderline	20	26.7
Cases	18	24.0

Figure 1: Factors independently associated with anxiety and depression among the participants

Table 3 and 4 shows a logistic regression analysis that indicates that none of the factors is independently associated with anxiety and depression. It also demonstrates that only duration of chronic kidney disease has reached statistical significance and is independently associated with anxiety and depression among the participants (p value = 0.014). Moreover, co-morbidities like Hypertension (88.5% and 94.4%) and Diabetes (30.8% and 38.9%) are found to be prevalent in most of the depressive and anxious patients respectively.

Percentage of cases in age group 41-60 years (42.3%), Unemployed (46.2%), Illiterate (23.1%), Nuclear families (57.7%) are found to suffer from depression along with CKD and other co-morbidities.

Table 3: Association of depression with various parameters

	Depression absent		Depression present		p-value
	n	%	n	%	
Age					
18-40 years	17	34.7%	6	23.1%	0.345
41-60 years	22	44.9%	11	42.3%	
>60 years	10	20.4%	9	34.6%	
Gender					
Female	18	36.7%	11	42.3%	0.173
Male	31	63.3%	15	57.7%	
Occupation:					
Ex-service man	2	4.1%	1	3.8%	0.575
Housewife or unemployed	18	36.7%	12	46.2%	
Professional	8	16.3%	2	7.7%	
Skilled worker	5	10.2%	5	19.2%	
Unskilled worker	16	32.7%	6	23.1%	
Education					
Illiterate	16	32.7%	6	23.1%	0.863
Upto 8th	3	6.1%	3	11.5%	
Upto 10th	13	26.5%	8	30.8%	
Upto 12th	10	20.4%	5	19.2%	
Graduate and above	7	14.3%	4	15.4%	
Marital status					
Married	47	95.9%	25	96.2%	0.960
Unmarried	2	4.1%	1	3.8%	
Family type					
Joint	25	51.0%	11	42.3%	0.472
Nuclear	24	49.0%	15	57.7%	
Comorbidities:					
Hypertension	40	81.6%	23	88.5%	0.443
Diabetes	11	22.4%	8	30.8%	0.430
Others	10	20.4%	7	26.9%	0.521
Duration of CKD					
≤ 1 year	21	42.9%	5	19.2%	0.014
1-5 years	26	53.1%	15	57.7%	
>5 years	2	4.1%	6	23.1%	

Table 4: Association of anxiety with various parameters

	Anxiety absent		Anxiety present		p-value
	n	%	n	%	
Age					
18-40 years	19	33.3%	4	22.2%	0.101
41-60 years	27	47.4%	6	33.3%	
>60 years	11	19.3%	8	44.4%	
Gender					
Female	21	36.8%	8	44.4%	0.564
Male	36	63.2%	10	55.6%	
Occupation:					

Ex-service man	2	3.5%	1	5.6%	0.175
Housewife or unemployed	22	38.6%	8	44.4%	
Professional	10	17.5%	0	0.0%	
Skilled worker	9	15.8%	1	5.6%	
Unskilled worker	14	24.6%	8	44.4%	
Education					
Illiterate	18	31.6%	4	22.2%	0.197
Upto 8th	3	5.3%	3	16.7%	
Upto 10th	18	31.6%	3	16.7%	
Upto 12th	9	15.8%	6	33.3%	
Graduate and above	9	15.8%	2	11.1%	
Marital status					
Married	54	94.7%	18	100.0%	0.321
Unmarried	3	5.3%	0	0.0%	
Family type					
Joint	29	50.9%	7	38.9%	0.375
Nuclear	28	49.1%	11	61.1%	
Comorbidities:					
Hypertension	46	80.7%	17	94.4%	0.166
Diabetes	12	21.1%	7	38.9%	0.129
Others	14	24.6%	3	16.7%	0.486
Duration of CKD					
$\leq$ 1 year	19	33.3%	7	38.9%	0.014
1-5 years	35	61.4%	6	33.3%	
>5 years	3	5.3%	5	27.8%	

Discussion

Chronic kidney disease is considered one of the most disabling diseases in the world, with a global prevalence rate of 8-16% in 2013 and 11-13% in 2016 [13]. Psychiatric disorders usually co-exist with most chronic illnesses and especially with CKD[14]. In this study, the frequencies of depression and anxiety among CKD patients are 34.7% and 24% respectively.

Previous studies established depression as the primary mental health problem of patients with CKD. The prevalence of depression among patients who have CKD is estimated to be between 20% and 30%, whereas the results of this study show 34.7% of the patients have depression which was statistically higher than the previous figure (and 25.3% to have borderline depression). On the other hand, it has been demonstrated that there are increasing levels of anxiety among patients with CKD. A previous study estimated the prevalence rate of anxiety in patients with CKD to be 12% to 52%; this corresponds to the results of this study, which found that 24% of patients had anxiety and 22.1% had borderline anxiety[15].

With regard to the duration of the dialysis, one previous study suggested that depression and anxiety run different courses in hemodialysis patients. Patients who remained depressed after 16 months of follow-up showed a decrease in quality of life and higher levels of depression; moreover, the prevalence of anxiety associated with depression was higher after 16 months of follow-up[16]. This study also demonstrates that duration of chronic kidney disease has reached statistical significance and was independently associated with anxiety and depression among the participants (p value = 0.014).

Limitation: The main limitation of the study was that only one centre was included. Although this hospital alone provided us many participants in a span of only 2 months, but still further research that includes other governmental and private centres is needed.

Conclusion

Depression and anxiety disorders are prevalent among elderly and male CKD patients who are on hemodialysis: 24% of our participants are found to have anxiety and 34.7% are found to have depression. Duration of illness is the only categorical variable associated with anxiety and depression. Meanwhile, older age, unemployment, illiteracy and other sociodemographic factors also affect the mental status of participants. Therefore, examination of these patients for mood disorders in order to achieve early diagnosis and management is needed to improve their and prevent adverse outcomes. These warrants raising awareness of planning and implementing screening programs for mood disorders among high-risk CKD patients in order to properly manage identified cases.

Declarations

Ethical approval: The study was approved by the Institutional Ethics Committee

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