

Psychiatric co-morbidity and clinical characteristics in patients of End stage renal disease undergoing hemodialysis: A cross sectional study

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Abstract

Background: End-stage renal disease (ESRD) is a global health problem with a high economic burden on the healthcare system. In patients, with ESRD, renal transplant, or hemodialysis is necessary for survival. However, considering challenges with the donor, hemodialysis remains the treatment of choice for a majority of patients. There is a potential for the emergence of various psychiatric disorders. This study was conducted to bring out the issues regarding the interface of psychiatry and renal failure. Depression, anxiety, suicide, and delirium are common complications observed in patients with renal failure. The neuropsychiatric disorders associated with renal disease may present various forms according to the natural history of the disease and remain

underdiagnosed and undertreated. Hence, this study aimed to study the prevalence of psychiatric co-morbidities in patients on hemodialysis.

Material and method: Patients above 18 years of age, diagnosed with ESRD, and undergoing dialysis for more than 3 months were taken through consecutive purposive sampling within a period of 3 months with their consent. The psychiatric interview was conducted only after the completion of the dialysis procedure and was assessed using the MINI international neuropsychiatric interview (M.I.N.I.).

Results: Among ESRD patients in the present study, 53.3 % (n=16) had a psychiatric illness, and the rest 46.7% (n=14) did not have any psychiatric disorder. The most prevalent psychiatric comorbidities were Major depressive disorder (MDD) (40%, n=12)

followed by Generalised anxiety disorder (GAD) (23.3%, n=7) and suicide (20%, n=6).

Conclusion: Psychiatric comorbidities are common among ESRD patients and are undiagnosed and untreated.

Keywords: ESRD, hemodialysis, psychiatric comorbidities

Introduction

Among chronic diseases, Chronic kidney disease (CKD) is emerging to be important.^[1] In India the prevalence of CKD stages 1,2,3,4, and 5 among adults is 7%, 4.3%, 4.3%, 0.8%, and 0.8%, respectively. ^[2]

The global burden of CKD is rising, and by 2040 it will become the 5th common cause of years of life lost.^[7]

The important cause for it is the significant rise in the incidence of hypertension (HTN), obesity, type 2 diabetes mellitus (T2DM), and aging among the population.^[6] If CKD remains uncontrolled, the disease progresses to ESRD, where life cannot be sustained without a renal transplant or hemodialysis.^[8,9] Every year about 220000 patients are diagnosed with end-stage renal disease (ESRD) with age-adjusted incidence to be 226 per million population. ^[3]

Considering the challenges with the donor for renal transplantation, hemodialysis remains the most desirable treatment of CKD stage 5 or ESRD. ^[4] Haemodialysis is a crude procedure, though it can prolong life but takes a lot in return. It requires a strict diet, frequent visits to the hospital or dialysis centers, nearly three visits in a week, and consists of a complex procedure. ^[5] It affects patient's work-life resulting in the loss of a working hour, leading to a financial burden. ^[10]

The patient also suffers from physical distress like fatigue and pain, reduced physical activity. Constraints

patient's social activities, employment, holidays, and socio-economic status.^[11]

Thus, increasing the duration of hemodialysis affects the patient's normal living leading to various physical, social, and psychological changes.^[10] Therefore there is a potential for the emergence of various psychiatric disorders. This study is being conducted to bring out the issues regarding the interface of psychiatry and renal failure. Depression, anxiety, suicide, and delirium are common complications observed in patients with renal failure. The neuropsychiatric disorders associated with renal disease may present various forms according to the natural history of the disease and remain underdiagnosed and undertreated. Hence, this study aims to study the prevalence of psychiatric comorbidities in patients on hemodialysis.

Material and Method

This hospital-based, cross-sectional study was carried out at a tertiary care hospital in Northern India during July 2020 and September 2020. The project proposal was approved by the Institute Ethics Committee. Patients aged 18 years and above, diagnosed with ESRD, and undergoing dialysis at the Nephrology department of the hospital for more than 3 months were taken through consecutive purposive sampling within a period of 3 months. Patients with recognized mental health difficulties, intellectual disabilities, history of any co-morbid psychiatric disorder currently on medication before the diagnosis of ESRD, patients who are unable to participate in the study due to the severity of the physical disease were excluded from the study. A total of 30 patients with ESRD. The patients were interviewed after the dialysis procedure was over. First, they were informed that their participation would be entirely voluntary and was not necessary for the treatment. The objective of this study

was explained to the patients and informed written consent was obtained. Privacy regarding the subject information was maintained. Withdrawal of subject consent at any stage of the study was accepted with dignity. Socio-demographic data were collected and the M.I.N.I. scale was applied to the patient. Data were collected, compiled, and tabulated. Results were statistically analyzed using the Statistical Package for the Social Sciences version 22 (IBM, USA).^[24] Parametric data were analyzed using paired and unpaired t-test. Frequency data were analyzed using the Chi-square test. The P-Value of 0.05 was taken as statistically significant.

Results

The present study included 30 consecutive ESRD patients undergoing hemodialysis.

Table 1 shows the sociodemographic characteristics of the study participants, in which 53.3% (n=16) were males and 46.7%(n=14)were females. The majority 56.7%(n=17) were in the age group of 31-60 years. Regarding the education of the participants, 23.3% (n=7) were illiterate, 30%(n=9) completed a high-school education, and 13.4%(n=4) held a graduation degree. More than half 53.3%(n=16) of the participants were unemployed. And about half of them, 50% (n=15), had a monthly family income of Rs19,000-30,000. Most belong to joint family 56.7% (n=17) and rural area 80% (n=18).

Table 2 shows, duration of ESRD for the majority of the participant i.e 80% (n=24) was more than 1year and the duration of dialysis for nearly half of the participants, 46.7%(n=14) was between 1-3 years and 23.3% (n=7) were undergoing dialysis for more than 3 years. About 73.3% (n=22) would visit the center twice per week for dialysis while 26.7% (n=8) would come thrice per week.

Table 3a shows that among all the ESRD patients in the present study, 53.3 % (n=16) had a psychiatric illness, and the rest 46.7% (n=14) did not have any psychiatric disorder. About 36.7% (n=11) of participants had both hypertension and diabetes mellitus. The MINI Scale was administered to the patient undergoing hemodialysis, according to which 40%(n=12) scored 5 or above points on MDD item and 23.3% (n=7) scored 3 or above on GAD item, and 16.7%(n=5) scored low points (1-8points) on suicidality and 3.3%(n=1) scored a moderate point (9-16points) on suicidality and 10% (n=3) had panic disorder, as depicted in table 3b. Out of 16 patients with psychiatric illness, n=5 patients had one psychiatric illness, n=11 had more than one psychiatric illness. Among the latter, 55% (n=6) had MDD with suicidality. Table 4 indicates that family type (p-value = 0.009) and marital status (p-value= 0.046) of the participant were significantly associated with psychiatric illness. None of the other factors is independently associated with psychiatric illness. The family type (p-value =0.016) and locality (p-value=0.58) of the participant were significantly associated with MDD.

Discussion

The primary aim of our study was to assess the psychiatric co-morbidity in patients undergoing hemodialysis. In our study, age-wise distribution showed that the majority 56.7% belong to the age group 31-60 years, which is similar to the study conducted by Goyal E et al.^[10] where the majority belong to the age group 41-60 (55.1%). The majority of the study sample belongs to rural background. Hence, failure to introduce preventive measures at an early age, poor knowledge about the illness, delay in detecting the renal disease, and late referral can be the reasons for the progression of renal failure.^[14]

The gender-wise distribution shows that males were more commonly affected by ESRD than females, which is similar to the findings by Suja A et al.^[14] and Elhadad AA et al.^[15] A majority (70%) of our participants were married, this may be because we have included participants over 18 years of age and also in India age of marriage is less.

In our study, 36.7% of the participants had both HTN and T2DM whereas in a study by Elhadad AA et al.^[15] 26.5% of patients had diabetes mellitus, 19.7% had hypertension, and 8.5% had both diabetes and hypertension. These factors contribute to the illness, therefore early management of T2DM and HTN can aid in the progression of renal failure. The lifelong treatment of renal failure along with diabetes and hypertension significantly increases the burden on patients and decreases the outcome.

Data analysis of our study showed that about 40% of the participants were diagnosed with ESRD and 23.3% were on regular dialysis for more than 3 years. A similar finding was observed in a study by Goyal E et al.^[10] where the duration of dialysis was more than 3 years among 46.9% of participants. Duration of dialysis for the majority (46.7%) participants in our study was between 1-3 years which is similar to the study conducted by Elhadad AA et al.^[15] in which 48.7% started dialysis within 1–5 years. The frequency of dialysis for most of our study participants was twice per week. The finding is not corroborative with the study by Goyal E et al.^[10] where the majority undergoes dialysis thrice a week.

Thus increase the duration of dialysis and frequent hospital visits lead to disruption in normal daily activities like difficulty in holding the job which further leads to unemployment, increase expenses on transportation and dialysis adds onto the financial

issues. Along with these other, physical and emotional stressors are present like waning sexual desire and impotence, fear of dying, diet and fluid restrictions, fatigue, loss of bodily function, and limitation of physical activities. Younger patients worry about marriage, having children, and the burden that they bring to their family.^[16] Hence all these factors make the patient vulnerable to a psychiatric disorder.

According to our study, the prevalence of psychiatric comorbidity among patients of ESRD on hemodialysis was 53.3%, which supports the previous studies that state the prevalence rates of comorbid psychiatric conditions to be 45% and 61.3% in ESRD patients on hemodialysis.^[10,12] In a study by Balaban ÖD et al.^[17] showed that near half of the participants had a psychiatric illness. Another study showed that 75.21% of dialysis patients suffered from psychiatric illness.^[15] According to an Indian study, 40% of CKD patients undergoing dialysis had psychiatric comorbidity.^[18] Another study conducted on 69 patients with ESRD found the prevalence of psychiatric illness to be 46%.^[19] The finding of these studies is similar to our study.

The most common comorbid psychiatric disorder that is associated with these patients is depression and suicidal ideation.^[13] As per our study, depression is the most prevalent psychiatric comorbidity too, as it constitutes 40% of the comorbidities related to the study participants followed by GAD (23.3%) and suicidality (20%) which is similar to the study conducted by Elhadad AA et al.^[15] which showed that 75.2% of them suffered from psychiatric illness, 56.4% of them suffered from depression, while 51.3% of them suffered from generalized anxiety disorders, 21.4% had suicidal ideations, and 7.7% suffered from panic attacks. This finding was similar to earlier studies that showed a 30%

to 40% prevalence of depression in CKD patients undergoing dialysis.^[20]

Similarly, various other studies showed that depression and anxiety are more prevalent in this population.^[21,22]

As per our study among participants with psychiatric illness, a majority (55%) had both MDD and suicidality. Hence, depression can be a major contributing factor to suicidality. According to a meta-analytic study, suicidal ideation was a common finding among those patients on dialysis with psychiatric morbidities.^[23]

A significant association of the presence of psychiatric illness with family type and marital status has been observed. Hence, putting all together we can say that ESRD is a chronic illness and require long-standing treatment which can affect patients coping skills over a while and make them vulnerable for psychiatric comorbidity. Their early identification and management are essential to avert the negative impact they exert on the patients 'quality of life as well as mortality risks. Very little systematic information is available on comorbid alcohol and drug abuse in patients with hemodialysis till now.

Knowing that psychiatric symptoms affect the quality of life negatively, training of the healthcare professionals who are primarily involved in the treatment of this group about psychiatric symptoms and signs may particularly increase the awareness of this group. Thus, patients with ESDR may have access to psychiatric treatment more easily.

Conclusion

Among the study participants, we observed that psychiatric comorbidities are common among ESRD patients and remain undiagnosed and untreated.

Further, efforts to improve quality of life and lessen the burden of hemodialysis require greater emphasis on the

early diagnosis and treatment of comorbid psychopathology.

To date, this effort has focused exclusively on depression and anxiety. Other psychiatric comorbidities like alcohol use disorder, psychosis can exert significant adverse effects on a patient's life and should be included in recognition and treatment efforts.

Limitation

- This study is a cross-sectional study, which eliminates the causal efficacy of all data.
- The sample size of the study was small.

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Abbreviation

- ESRD- End stage renal disease
- CKD- Chronic kidney disease
- M.I.N.I.- MINI international neuropsychiatric interview
- MDD- Major depressive disorder
- GAD- Generalized anxiety disorder
- HTN- Hypertension
- T2DM- Type 2 Diabetes mellitis

Table 1: Sociodemographic characteristics of the study participants

Sociodemographic Variables		Frequency (N= 30)	Percentage
Gender	Male	16	53.3%
	Female	14	46.7%
Age	<30	4	13.3%
	31-60	17	56.7%
	>60	9	30.0%
Marital Status	Unmarried	9	30.0%
	Married	21	70.0%
Religion	Hindu	23	76.7%
	Islam	4	13.3%
	Sikhism	3	10.0%
Educational Status	Illiterate	7	23.3%
	Primary school	1	3.3%
	Middle school	7	23.3%
	High school	9	30.0%
	Intermediate	2	6.7%
	Graduate	2	6.7%
	Professional	2	6.7%
Occupation Of The Patient	Unemployed	16	53.3%
	Employed	14	46.7%
Family Type	Nuclear	13	43.3%
	Joint	17	56.7%
Locality	Rural	18	60.0%

	Urban	12	40.0%
Medical Comorbidites	Hypertension	9	30.0%
	T2DM	5	16.7%
	Both	11	36.7%

Table 2: Clinical characteristics of the study participants

Clinical characteristics		Frequency	Percentage
Duration Of CKD	<1 yr	6	20.0%
	1-3 yr	12	40.0%
	>3 yr	12	40.0%
Duration Of Dialysis	<1 yr	9	30.0%
	1-3 yr	14	46.7%
	>3 yr	7	23.3%
Time-lag between Diagnosis of ESRD and 1st Haemodialysis. (in months)	No lag	16	53.3%
	Less than 6 months	8	26.7%
	7-12 months	6	20.0%
Frequency of dialysis per week ?	Twice / week	22	73.3%
	Thrice /week	8	26.7%

Table 3a: Prevalence of psychiatric illness among participants

Psychiatric illness	No. of cases	Percentage
Yes	16	53.3%
No	14	46.7%
Total	30	100.0%

Table 3b: Prevalence of psychiatric co-morbidities among study participants

M.I.N.I Scale	No. of cases	Percentage out of total patient
Major Depressive Episode (>5points)	12	40.0%
Panic (>4points)	3	10.0%
Agoraphobia	1	3.3%
Social Anxiety Disorder (>4points)	2	6.7%
Alcohol Use Disorder	2	6.7%
Any Psychotic Disorder	1	3.3%
Generalised Anxiety Disorder (>3points)	7	23.3%

Antisocial Personality Disorder	1	3.3%
Suicidality (Low=1-8points)	5	16.7%
Suicidality (Moderate = 9-16)	1	3.3%

Table 4: Association of sociodemographic variables with psychiatric illness in ESRD patients undergoing hemodialysis.

Variables		Psychiatric illness				Total	Chi-square value	p-value
		Yes		No				
Gender	Male	8	50.0%	8	57.1%	16	0.153	0.696
	female	8	50.0%	6	42.9%	14		
Age (in years)	>30 yrs	2	12.5%	2	14.3%	4	0.930	0.628
	31-60 yrs	8	50.0%	9	64.3%	17		
	>60yrs	6	37.5%	3	21.4%	9		
Marital status	Unmarried	2	12.5%	7	50.0%	9	5.000	0.046
	Married	14	87.5%	7	50.0%	21		
Religion	Hindu	14	87.5%	9	64.3%	23	3.971	0.137
	Islam	2	12.5%	2	14.3%	4		
	Sikhism	0	0.0%	3	21.4%	3		
Educational status	Illiterate	4	25.0%	3	21.4%	7	1.224	0.747
	Primary school	1	6.3%	0	0.0%	1		
	High school	4	25.0%	3	21.4%	7		
	Graduate	7	43.8%	8	57.1%	15		
Occupation of the Patient	Unemployed	9	56.3%	7	50.0%	16	0.117	0.732
	Employed	7	43.8%	7	50.0%	14		
Family income	3	1	6.3%	0	0.0%	1	4.888	0.299
	4	10	62.5%	5	35.7%	15		
	5	0	0.0%	1	7.1%	1		
	6	5	31.3%	7	50.0%	12		
	10	0	0.0%	1	7.1%	1		
Family Type	Nuclear	3	18.8%	10	71.4%	13	8.438	0.009
	Joint	13	81.3%	4	28.6%	17		
locality	Rural	12	75.0%	6	42.9%	18	3.214	0.135

	Urban	4	25.0%	8	57.1%	12		
Co-morbidities	Hypertension	6	37.5%	3	21.4%	9	4.578	0.205
	T2DM	4	25.0%	1	7.1%	5		
	BOTH	5	31.3%	6	42.9%	11		
	NONE	1	6.3%	4	28.6%	5		
Duration of CKD	1	2	12.5%	4	28.6%	6	1.205	0.547
	2	7	43.8%	5	35.7%	12		
	3	7	43.8%	5	35.7%	12		
Duration of Dialysis	1	4	25.0%	5	35.7%	9	1.269	0.530
	2	7	43.8%	7	50.0%	14		
	3	5	31.3%	2	14.3%	7		
Time-lag between Diagnosis of ESRD and 1st Haemodialysis. (in months)	1	6	37.5%	10	71.4%	16	4.051	0.132
	2	5	31.3%	3	21.4%	8		
	3	5	31.3%	1	7.1%	6		
Frequency of dialysis per week ?	1	11	68.8%	11	78.6%	22	0.368	0.544
	3	5	31.3%	3	21.4%	8		
Total		16	100.0%	14	100.0%	30		