

Psychiatric Morbidity in End Stage Renal Disease Patients on Haemodialysis: A Case Series Study

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Abstract

Background: End-stage kidney or renal disease (ESRD) is often termed the last stage of chronic kidney dysfunction where in the kidneys are no longer in a position to function good enough to meet the needs of daily life. The usual treatments for ESRD are dialysis or kidney transplant. These patients are prone for various psychological stressors leading to various psychiatric illnesses. Present study was planned to find the psychiatric morbidity and the type of morbidity in patients with ESRD undergoing haemodialysis (HD).

Methods: A total of 40 consecutive patients diagnosed as having ESRD in dialysis unit of S.N. Medical College and HSK Hospital Research Centre, Bagalkot were evaluated using M.I.N.I. PLUS. Fischer's exact and Chi-square tests were used to check the association between two variables. Statistical analysis was done to get the results.

Results: 42.5% of patients with ESRD had psychiatric morbidity where major depressive episode and dysthymia constituted 32.5% and 10% of the sample respectively. Study participants were in the age group of 18 to 65 years, 70% were males and 30% were females. Post haemodialysis complication of infection was most common in 55% cases. But, none of the results were statistically significant.

Conclusion: Majority of ESRD patients do have some psychiatric morbidity commonest being major depressive disorder followed by dysthymia. A multidisciplinary approach is essential necessary which will definitely improve prognosis of these unfortunate patients.

Keywords: End-Stage Renal Disease; Chronic Kidney Disease; Haemodialysis; Depression.

Introduction

End-stage renal disease (ESRD) refers to a stage of chronic renal dysfunction in which uremic syndrome develops due to the accumulation of fluids, toxins and electrolytes which are normally excreted through kidneys. This may lead to death if the toxins are not eliminated by renal replacement therapy, using either the dialysis or renal transplantation [1]. The term chronic kidney failure represents the process of persisting significant irreversible decrease in the number of nephrons and typically corresponds to third till fifth stages in chronic kidney disease [2].

Haemodialysis (HD) is a physicochemical process involving single pass of blood and dialysis solution (dialysate) across a semi-permeable membrane. The solutes move across the membrane by diffusion, but water moves by ultra-filtration to reach a state of equilibrium [3]. Those membranes act as molecular size-selective filters and the size threshold is dependent on the nature of the membrane.⁴ It is an artificial way of filtering blood which targets removal of toxins and excess fluids from the blood where in the blood is purified by an external artificial kidney machine. Patients will have to spend 3 to 4 hours for one haemodialysis session and needs 2-3 such

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sessions per week. Patients are often asked whether they perceive any reduction in the energy levels, any stressors leading to decrease in self-confidence levels, doubtfulness about their future, guilt towards other people in the family [5]. Levy introduced the term "psychonephrology", for such kind of mental health problems associated with patients having chronic kidney disease (CKD) with special reference to psychiatric problems in patients suffering from kidney disease, particularly those with kidney failure undergoing maintenance dialysis or renal transplantation [6].

For the sake of collecting the data to document and characterize the patterns of CKD, a registry had been set up in 2005 by the Indian Society of Nephrology. The most common cause was diabetic nephropathy followed by CKD of undetermined aetiology and chronic glomerulonephritis in the Indian Registry [7]. Chronic kidney disease (CKD) is emerging to be an important chronic disease globally possibly due to the rapidly increasing incidence of diabetes and hypertension worldwide [8].

A study by Rajapurkar M, reported the incidence of ESRD as 181 per million population in 2005 in central India and prevalence of CKD ranging from 0.79% to 1.4% [9]. According to GK Modi et al. average crude and age-adjusted incidence rates of End stage renal disease was 150 per million population in 2002, 143 per million population in 2003, 149 per million population in 2004 and 163 per million population in 2005 [10]. Of late, haemodialysis facilities are made available at many district hospitals in India with the help of many state governments. In addition all government hospitals in big cities, metros and even private hospitals are having such facilities. Therefore, it may be important to study the psychiatric morbidity in end stage renal disease cases on haemodialysis. The department of medicine in our kumareshwar hospital, Bagalkot, is having hemodialysis facilities having 5 beds, from year 2005 onwards.

Psychiatric disorders are common among patients with chronic kidney disease (CKD) and these include depression, dementia, delirium, psychosis, anxiety, personality disorders and substance abuse. The commonest psychiatric disorder in patients with end-stage renal disease (ESRD) is major depressive disorder. The prevalence of depression in CKD patients has varied widely in different studies and different populations, using different assessment tools [11].

Patients on HD are prone to emotional problems possibly due to the chronic stress in relation to the burden of the disease, restrictions in food intake, financial limitations, impaired quality of life (QOL),

co-morbid chronic medical illnesses, medication induced side effects, and fear of dying [12,13]. Haemodialysis is a life sustaining treatment for patients with ESRD. This feeling of artificial life totally depending on every haemodialysis session could be acting as tremendous stress factor for patients with ESRD. Sleep related disorders among these patients are often related to disability, pain, duration of dialysis treatment sessions, increased creatinine and/or urea levels and somatic complaints like itching [14].

Chronic kidney disease patients on long term haemodialysis are under enormous stress. Nature of the stress could be physical, psychosocial, emotional and/or economical. These patients have the knowledge that they are on artificial life support, which itself might lead to persistent fear of dependency and disability. The investigator felt that psychiatric co-morbidity, sometimes hidden behind an array of vague symptoms could be affecting the outcome of treatment modalities in these patients. It is necessary therefore, to carefully assess the patients undergoing haemodialysis and treat them holistically to improve prognosis and quality of life in these unfortunate patients. With this background in mind the present study was undertaken.

Aims and Objectives

1. To find the psychiatric morbidity in patients with ESRD undergoing HD.
2. To study the type of psychiatric morbidity among ESRD patients undergoing HD.

Materials and Methods

This study is on Psychiatric morbidity in end-stage renal disease cases on haemodialysis who attended the dialysis unit of S.N. medical college and HSK hospital and research centre, Bagalkot.

Study Design

Descriptive cross sectional study.

Sampling

Patients with ESRD who are on haemodialysis.

Sample Size

M Rai et al. who conducted a study at state-run tertiary care hospital in New Delhi, found the

prevalence of depression in their study population to be 47.8% [15].

Sample size calculation was done by Open Epi trial version (2.3.1) software.

P = 47.8%

Absolute precision = 16%

Design effect = 1

At 95% confidence level

Sample size $n = [DEFF * Np(1-p)] / [(d^2 / Z_{1-\alpha/2}^2 * (N-1) + p*(1-p))]$

Sample size calculated = 38. So, a sample size of 40 was decided to be taken. All patients undergoing hemodialysis and who satisfied the Inclusion and Exclusion criteria formed the sample of the study.

Inclusion Criteria

- (1) Admitted for haemodialysis in the dialysis unit.
- (2) Above 18 years and below 65 years of age.
- (3) Undergoing dialysis more than 3 months.
- (4) Who gave written informed consent.

Exclusion Criteria

1. Patients who refused to give written informed consent.
2. Critically ill.
3. Unconscious / Altered consciousness patients.
4. Un co-operative patients.

Procedure

The institutional ethical committee clearance was obtained. The design and nature of the clinical study was explained to the patients. Informed consent was obtained from each patient who were included in the study, after satisfying inclusion and exclusion criteria. All the patients visiting the Dialysis centre in the hospital during the period from 1st Jan 2014 to 31st July 2015 formed the sample of this study.

We used a specially prepared proforma which included present history, past history, family history, personal history, demographic details, illnesses details and dialysis details. Later on general physical examination and mental status examination was conducted and relevant findings were noted. Then each patient was given MINI scale by the investigator to know type of illnesses if any. Further each patient was examined independently by experienced consultant psychiatrist to know psychiatric

diagnosis clinically. All the findings were tabulated and results were obtained. Results of psychiatric diagnoses on MINI scale examination were tabulated. Statistical evaluation was done using Chi-square test and Fisher's exact test wherever appropriate.

Tools for Assessment

M.I.N.I PLUS (Mini International Neuro-Psychiatric Interview Scale): The Mini-international neuropsychiatric interview is a short structured clinical interview used by many researchers for diagnosing psychiatric disorders according to DSM-IV. It was designed for epidemiological studies and multicenter clinical trials. It is very convenient for administering and it requires less time than any other diagnostic interviews like the Schedules for Clinical Assessment in Neuropsychiatry (SCAN), the Composite International Diagnostic Interview (CIDI) or the Structured Clinical Interview for DSM-IV disorders (SCID). MINI being a relatively brief scale, is divided into different modules which correspond to diagnostic categories such as major depressive episode, dysthymia, suicide, mania/hypomania, panic disorders, social phobia, post traumatic stress disorder, alcohol and other psychoactive substance, psychotic disorders, anorexia nervosa, somatisation disorder, hypochondriasis and other anxiety spectrum disorders including obsessive compulsive disorder. It does not assess the personality disorders. One can finish administering this instrument in just 15 minutes [16].

Statistical Analysis

Data was collected and tabulated using Microsoft excel. Frequency and percentages calculated for all quantitative measures. Mean and standard deviation were calculated for qualitative measures. Chi-square test and Fisher's exact test were used to analyse categorical values and check the association between two variables. P value of <0.05 is considered as statistically significant. SPSS 11 was used to process the data.

Results

Total of the participants were 40 and males were 28 and females were 12 (Table 1). A large majority i.e. 35 (87.50%) patients belonged to married group. Out of this only 14 (35.00%) had psychiatric morbidity. As shown in Table 2 and Figure 1, in the present study, 17 (42.50%) cases had some type of psychiatric

morbidity. Only 23 (57.50%) cases were free of any psychiatric problems as shown in Table 1. Major Depressive episode (32.50%) was the major morbidity followed by Dysthymia (10.00%). These results also correlated with the clinical psychiatric diagnosis as per the ICD-10. Even though 17 (42.50%) of cases did suffer from psychiatric illness, all were having depression related disorder and other type of psychiatric disorders were absent. Socio-economic status of the cases was assessed by applying

Modified B.G. Prasad 2014 classification. Table number 2 reveals that majority of the cases belonged to social class-II numbering 12 (30.00%) and social class-I numbering 11 (27.50%). Thus totally 23 (57.50%) cases were from higher income group. ESRD treatment of continuous long term dialysis being quite costly was perhaps not affordable to lower income group of social class-IV and social class-V. Hence only 10 (25.00%) cases were from these groups.

Table 1: Sociodemographic details

(N-40)

Variables		Numbers (%)
Gender	Male	28(70%)
	Female	12(30%)
Age(in years)	<=25	01(2.5%)
	26-35	12(30%)
	36-45	5(12.5%)
	46-55	10(25%)
	56-65	12(30%)
Education Status	No Education	07(17.5%)
	Primary Education	05(12.5%)
	Secondary Education	13(32.5%)
	College Education	08(20%)
	Graduation and above	07(17.5%)
Family History of Psychiatric Illness	Present	1(2.5%)
	Absent	39(97.5%)
Family History of Major medical illness	Present	2(5%)
	Absent	38(95%)
Socioeconomic status	I	11(27.5%)
	II	12(30%)
	III	07(17.5%)
	IV	09(22.5%)
	V	01(2.5%)
Duration of Chronic Kidney Disease	<=60 (months)	38(95%)
	61-120 (months)	1(2.5%)
	241+ (months)	1(2.5%)
Marital Status	Single	2(5%)
	Married	35(87.5%)
	Divorced	1(2.5%)
	Widow	2(5%)
Past History of Diabetes Mellitus	Present	13(33%)
	Absent	27(67%)
Past History of Hypertension	Present	25(63%)
	Absent	15(37%)

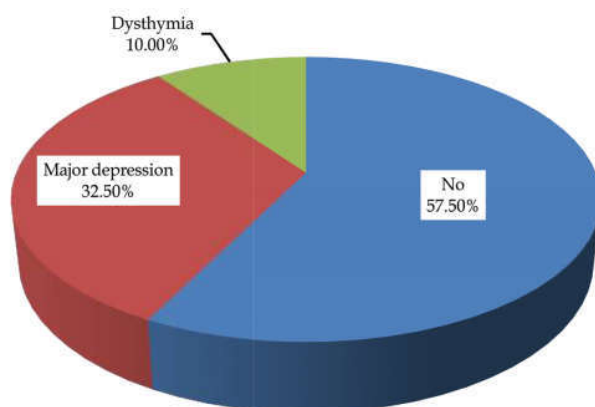


Fig. 1: Distribution of study participants according to Psychiatric morbidity

Table 2: Distribution of study participants according to Psychiatric morbidity

Psychiatric Morbidity	Psychiatric Morbidity	
	Number	Percentage
Major Depressive episode	13	32.50%
Dysthymia	4	10.00%
Nil	23	57.50%
Total	40	100.00%

Table 3: Distribution of psychiatric morbidity in study participants according different variables

Variables		Psychiatric Morbidity			Chi Square Value	P-Value
		Major Depression	Dysthymia	None		
Gender	Male	9(32.14%)	4(14.28%)	15(53.58%)	X ² =1.968	p=0.374
	Female	4(33.33%)	0(0.00%)	8(66.67%)		
Age	<=25	0(0.00%)	0(0.00%)	1(100.00%)	X ² =8.048	p=0.429
	26-35	4(33.34%)	3(25.00%)	5(41.66%)		
	36-45	2(40.00%)	1(20.00%)	2(40.00%)		
	46-55	4(40.00%)	0(0.00%)	6(60.00%)		
	56-65	3(25.00%)	0(0.00%)	9(75.00%)		
Socioeconomic status	I	3(27.22%)	1(9.09%)	7(63.69%)	X ² =3.208	p=0.921
	II	4(33.34%)	2(16.66%)	6(50.00%)		
	III	2(28.58%)	0(0.00%)	5(71.42%)		
	IV	4(44.40%)	1(11.20%)	4(44.40%)		
	V	0(0.00%)	0(0.00%)	1(100.00%)		
Educational Status	No	2(28.58%)	0(0.00%)	5(71.42%)	X ² =8.327	p=0.402
	Primary	0(0.00%)	1(20.00%)	4(80.00%)		
	Secondary	7(53.84%)	1(7.69%)	5(38.47%)		
	College	1(12.50%)	1(12.50%)	6(75.00%)		
	Graduation and above	3(42.86%)	1(14.28%)	3(42.86%)		
Duration of Kidney Disease in Months	<=60	13(34.22%)	4(10.52%)	21(55.26%)	X ² =1.556	p=0.817
	61-120	0(0.00%)	0(0.00%)	1(100.00%)		
	241+	0(0.00%)	0(0.00%)	1(100.00%)		
Marital Status	Single	0(0.00%)	1(50.00%)	1(50.00%)	X ² =6.476	p=0.372
	Married	11(31.42%)	3(8.58%)	21(60.00%)		
	Divorced	1(100.00%)	0(0.00%)	0(0.00%)		
	Widow	1(50.00%)	0(0.00%)	1(50.00%)		

Discussion

Prevalence of depression in ESRD cases has varied widely according to different studies in the world. Prevalence of Depression according to various studies is as follows Watnik S -30%, O Amira-23.7%, Aghanwa-25%, and it is reported much higher according to studies by Zeb Saeed-70% and by Pramiladevi- 72.7% [17-21]. If one takes dysthymia as one of the chronic low intensity depressive disorder then present study has got prevalence of depressive disorders to be 42.50% (Major Depressive episode 32.50% and dysthymia 10.00%). There was no statistical significance. This is broadly similar to the finding of M Rai et al. of 47.8% [15]. This was an Indian study from New Delhi. The prevalence of depression in CKD patient has varied widely in different studies and different populations, using different assessment tools as mentioned by Kimmel

PL and Peterson RA in the year 2006 [11]. These cases of ESRD are basically from Nephrology department. Hence few studies might have been conducted by Nephrologists or Physicians and not by Psychiatrists. This could be another reason for wide variation in the prevalence of depressive disorders in ESRD patients. Surprisingly, there was no other type of psychiatric illness in this sample. Even though, anxiety disorders were expected in these cases because ESRD cases are chronic and there are many stress factors like “dependency feeling” on dialysis and its nature of artificial life support, constant needs of physical and psychological support by relatives and economical costs involved in each session must be putting tremendous amount of stress on these patients which could lead to anxiety and related disorders. However, this study did not find a single anxiety disorder case in the sample. An Indian study by S.Kohli reported 87% of patients having anxiety state [22]. Another study by Carmen M

Perales Montilla et al. reported that anxiety state was seen in 24.9% of patients [23]. In this present study, anxiety symptoms or high suicidal ideas or history of suicidal attempt and gross OCD symptoms were not found in any of the subjects. However, study by Macaron G et al. reported 37% of cases having suicide ideas [24] and as per the study by Epameinodas Lyros et al., obsessive-compulsive symptoms were important aspect of their patients [25]. Absence of any other psychiatric illness except depressive disorder in this sample could be because of less number of sample size in this study.

Majority of these cases were between the ages of 26 yrs to 55 years. But, youngest age group i.e ≤ 25 yrs was only one patient which is expected in chronic kidney disease (Table 1). Except this age group all other age groups had almost equal distribution of major depression. It may be that the youngest age group patient is less mature to understand the gravity of CKD and after the age of 55 years patients learn to accept the reality of CKD and had less of depression as reaction to their major medical problem of ESRD. There was no statistical significance (Table 3). ESRD is a chronic disease. It certainly has poorer prognosis. Patients require continuous dialysis and they are on artificial life support. Patients require constant medical attention, caregivers' cooperation and support. Above all it is costly treatment over long period of time. Thus ESRD is also one of those chronic medical conditions where prognosis is poor like myocardial infarction, various types of cancer, especially of oropharynx and pancreatic, Parkinson's disease, HIV positive individuals, diabetes mellitus, hypothyroidism and ESRD as mentioned in textbook of medicine. Between 20% to 30% such patients do have depression [26]. Present study found major depression in many of the cases which is almost similar to other chronic medical disorders.

The gender association on the type of psychiatric morbidity affected was not statistically significant as $X^2(2)=1.968$, $p=0.374$. In other studies done by Muhammed Anees and Pramiladevi also reported more number of males as compared to females in their samples [21,27]. In India usually males are given more preference in giving continuous treatment of any illness. This is more true of socially backward areas like Bagalkot district where this study was conducted. In addition, chronic renal disease may be more common in males. These factors may explain the preponderance of male patients in this sample.

We did not find any statistically significant association between the educational status, socioeconomic status, marital status, duration of illness of the patients suffering from chronic kidney

disease and the psychiatric morbidity (Table 3). However, one can safely say that psychiatric morbidity in CKD must be starting early in the period of ESRD. Future studies with more details of subdivision of duration of CKD and presence of psychiatric morbidity would throw light on this aspect.

Marital status perhaps protects from the psychiatric morbidity if the married partner gives a lot of support to the patient. It could also be argued that having married increase stressors in terms of marital responsibilities which may add to psychiatric problem. Therefore, a definite comment cannot be made from this study specially when the finding are not statistically significant. In another study by Anees M et al. there were also large majority of patients numbering 77 (86.50%) who were married which is similar to present study's figure of 35 (87.50%) [27].

One study by Jha V et al, states that diabetic nephropathy was commonest cause of CKD in India [7]. Another study by Gupta R et al, argued that CKD is emerging to be important chronic disease globally because of rapidly increasing worldwide incidence of Diabetes and Hypertension [8]. Both these conditions are known to increase psychiatric morbidity and are also related to CKD. However, definite comments cannot be made because there is no statistical significance in this study regarding these factors. Infections as a Post Haemodialysis complications were present in 22 (55.00%) of the cases studied. Out of these 11 (27.50%) had Psychiatric morbidity and 11 (27.50%) had Nil Psychiatric morbidity. Other complications were absent. The results were not statistically significant with $X^2(3)=1.125$, $p=0.29$. Past history or family history of either major medical illness or any psychiatric illness did not have any association with psychiatric morbidity. Still, 5 out of 13 cases of diabetes i.e. 38.50% of diabetics with ESRD had psychiatric morbidity of major depression. This little higher figure in this study could be because these patients were having both ESRD and diabetes leading to increased psychiatric morbidity.

Limitations

The cross-sectional psychiatric assessment of the patients limits explanation of causal relation between psychiatric disease and end-stage renal disease. This is hospital based study having small number of cases as the study was limited to the patients attending the dialysis unit of S.N Medical College and H S K Hospital and Research center, Bagalkot. Results of this hospital based study cannot be generalized to entire population.

Conclusion

ESRD is commonly said as the final stage of the chronic kidney disease. It is not an uncommon scenario where in a psychiatrist opinion is sought for these patients especially on haemodialysis. Patients are usually questioned about the restrictions in the intake of fluids and meals, about symptoms like itching, decreased energy, psychosocial stressors like as loss of self-esteem, worthlessness, hopelessness, guilty feelings towards members in the family and any issues in the society. Present study was planned with the objectives to know the psychiatric disorders in patients suffering from end stage renal disease. Present study is on small number of subjects. There was no statistical significance in any association studied. Hence definite conclusions cannot be drawn. However, majority (42.5%) of ESRD patients do have some psychiatric morbidity, commonest being major depression found in 32.50% of cases. However, prospective studies and population based studies on this topic would be highly useful. Though there was no statistical significance this study suggested that there is a trend of Psychiatric morbidity to be associated with higher education and higher social class along with presence of diabetes/hypertension in these cases. It indicates a need for more studies in multiple centres on large number of patients, findings of which may guide clinicians to treat patients more effectively. A multidisciplinary approach may be necessary in this regard. It will definitely improve prognosis of these unfortunate patients.

Abbreviations

ESRD-End stage renal disease, HD-Haemodialysis, SPSS-Statistical Package for Social Studies, CKD-Chronic kidney disease.

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