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Level of anxiety and depression and its clinical and socio-demographic determinants among the patients of chronic kidney disease requiring dialysis.

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Abstract

Aims: Recent studies have shown increase in various psychiatric disorders in patients requiring Hemodialysis (HD). The present study was planned to study the level of anxiety and depression and its clinical and socio-demographic determinants among the patients who requires hemodialysis from a tertiary care centre in Haryana, India.

Methods: 41 patients with end stage renal disease (ESRD) on maintenance HD were recruited for the study. Demographic characteristics, clinical profile and dialytic data for each subject were noted. Further assessment of anxiety and depressive disorder were done by using Beck Anxiety Inventory (BAI) and Beck Depression Inventory (BDI) score respectively.

Results: Depression presents statistically significant association with duration of dialysis(P=0.002); Majority of the patients for less than 5 years on dialysis were normal or had mild depression(80.8%), whereas majority of the patients experienced higher levels of depression after five years(60%). The overall prevalence of anxiety was found out to be 36.6%. It is observed that as with depression, Duration of dialysis had a significant correlation with anxiety levels (P=0.004).Other socio-demographic and clinical variables were not found to be significant.

Conclusions: Duration of dialysis was found to be a significant predictor of depression and anxiety in patients of ESRD.

Keyword: **A**nxiety, Depression, Chronic Kidney Disease (CKD), End Stage renal Disease (ESRD), Hemodialysis.

Introduction

Chronic Kidney Disease(CKD) affects~10-15% of the adults globally[1]. In stages 1-4 of CKD, treatment(i.e. pharmacotherapy and diet) is focused on slowing the progression of the kidney disease and preventing or treating complications and co-morbid conditions. In the final stage of CKD (i.e. stage 5 or end stage renal disease[ESRD], renal replacement therapy[RRT] such as dialysis or kidney transplantation becomes necessary to maintain life. ESRD is a major public health issue in both developed and developing countries[2][3]. With increasing number of patients developing CKD, the number of patients requiring renal replacement therapy (RRT) is set to increase exponentially. This can cause increased burden on healthcare system.

Due to lack of accurate national data collection, the incidence of CKD in India is not clear but studies estimate that the number of new patients diagnosed with ESRD who are started on dialysis or transplantation is over 100,000 per year. This number grossly underestimates the true burden of kidney disease in our country given the inequality in access to health care between urban and rural populations, due to disparities in wealth and literacy [4].

Aside from these general population-based issues, there are unique medical and socio-economic challenges faced by women which are essential to understanding in order to improve their access to kidney care and therefore their overall physical and psychosocial health.

Levin was first to introduce the term “psychonephrology”, so as to highlight that patients undergoing RRT usually encounter with multiple stressors thus resulting in psychiatric disturbance[5].

Patients with CKD are required to make ongoing psychological adjustments over the course of their disease, such as accepting the life threatening diagnosis and need for lifelong treatment, learning dialysis techniques, restrictions in daily life, compliance to therapeutic regimen including restrictions in diet, fatigue, the fear of death, failure to fulfil prior roles un family, and dependency upon treatment and health professionals [6].In light of such a substantial and sustained disease burden; the management of CKD\ESRD has expanded from strictly clinical end points toward maintenance of quality of life (QOL), from diagnosis through to end of life care. Of paramount importance are psychological concerns related to the disease and associated renal treatment [7].Regarding differences between the main methods of RRT that is Haemodialysis [HD] and Peritoneal dialysis [PD], HD patients have been found to experience more depressive symptoms than PD patients [8]. Depression may be linked to HD treatment modality, since the patient has to be continually connected to the HD machine during dialysis and so experience significant restrictions in independent living [9].Patients on HD face many psychological disturbances due to psychological distress [10] including depression and anxiety [11][12][13] with increased symptom load and poor QoL[14].Furthermore these psychological problems can contribute to conflictions between themselves and their medical carers. Such findings are attributed in past to the stressful conditions in the HD treatment modality, including frequent visits and prolonged waiting time in the dialysis unit [15].Interestingly, health professionals focus on managing the biological dimension of the disease and usually underestimate symptoms from mental dimension. This effort becomes

highly confounded since symptoms of anxiety and depression usually overlap with clinical symptomology of kidney disease, specifically uremic state. For instance, components of depression such anorexia, fatigue, sexual and sleep disturbances share common characteristics with uremic state. According to estimates, 20-30% of dialysis patients experience depression, thus making an imperative need, the evaluation of depression in clinical routine[16].

Review of Literature

Psychiatric disorders commonly co-exist with the diagnosis of chronic kidney disease (CKD).

Depression is an emotional state characterized by somatic and cognitive symptoms including feeling of sadness, worthlessness, sleeplessness, loss of appetite and sexual desires, and interest in usual activities [17].Research on depression and CKD has increased to a great extent.

Multiple studies have demonstrated that depression is more prevalent in CKD and that end-stage renal disease is a robust risk factor for adverse outcomes such as hospitalization and mortality, yet these are often underdiagnosed or untreated.

Anxiety is another commonly co-occuring psychopathology with CKD/ESRD. Anxiety is an emotional state in which the individual experiences intense fear, uncertainty, and dread from the anticipation of a threatening situation. Compared to depression, however, the links between anxiety and CKD are less studied.

1. In a study conducted by Hedayati SS, Jiang W, O'Connor CM, et al, When compared with the general population, patients with ESRD showed more than five times the rate of suffering from depression[18].
2. In a study done previously, Older patients presented with lower levels of physical well-being and higher scores of depression[19][20].
3. Keskin et al, in a study revealed that depression is a risk factor for suicidal ideation and the chances of suicide attempts increasing with severity of depression[21].
4. A study revealed that, gender is reported to have an effect; so female patients present higher scores of depression and trait anxiety and lower scores in positive affect[22].
5. In studies, an inverse relation was observed between depression and socio-economic status[23][24].
6. In a previous study done, the prevalence rate of anxiety in patients with ESRD was estimated to be around12% to 52%[25].
7. In a recent review conducted by Veater and East, kidney transplant patients were noted to experience elevated levels of depression as compared to general population but generally lower rates of depression compared to patients on other RRTs[26].
8. Mapes et al demonstrated that among patients on HD, depression was independently associated with increased mortality and hospitalization[27].
9. A study done by Chiang et al showed that, Being married was related to better physical well-being as well as emotional health[28].
10. A study showed that higher economic and educational level is associated with higher health-related QoL[29].

Aims and Objectives

1. To assess the level of anxiety among patients with CKD requiring dialysis.
2. To assess the level of depression among patients with CKD requiring dialysis.

Materials And Methods

Study design and setting: It was a questionnaire based cross-sectional descriptive study which was conducted during 2 months at the haemodialysis unit of tertiary care centre of Haryana.

Participants: Participants were 41 patients with ESRD on maintenance HD, residents of Haryana. The protocols were explained to participants, after which participants gave verbal informed consent. All subjects were informed about the purpose of the study and their rights to refuse or discontinue participation in the study according to Ethical Standards of the Helsinki Declaration in 1983. Ethical permission for the study was be obtained from the Institutional Ethics committee (IEC) of the hospital.

The subjects (HD patients) were selected according to the following criteria:

1. Diagnosis of Chronic Kidney Disease
2. Current HD treatment
3. Age 18 years and above
4. Patients not having any previous psychological disorders.

All subjects with an intellectual disability or those who had a sensory deficit which prevents them from having the psychiatric interview were excluded.

Procedure

Patients were scheduled to come for dialysis every 3-4 days. There is a morning and afternoon shift each day. Our tertiary care centre has two HD set ups. Each HD session takes approximately four hours. All attending patients were interviewed face to face for the administration of Beck Depression Inventory and Beck Anxiety Inventory.

Measures

The following were the four parts of the survey questionnaire:

The first one related to the demographic characteristics including age, gender, marital status, socioeconomic level, education level.

The second part evaluated the clinical and dialytic data foreach subject.

The third part of the survey was concerned with the assessment of anxiety disorder using Beck Anxiety Inventory(BAI).

BAI was developed to measure anxiety in adult patients. It can be used in different populations and is easy to deploy and interpret. BAI has 21 items that assess symptom intensity from 0(absent) to 3(severe symptoms, almost unbearable)[30].

A score of 0-21 indicates low anxiety; 22-35 moderate anxiety and 36 and above severe anxiety.

The fourth part of the survey was concerned with the assessment of depressive disorder using Beck Depression Inventory(BDI).

BDI was developed by Aaron T. Beck, and is performed to detect depressive symptoms and their intensity in patients aged over 13 years. The scale consists of 21 items, and the intensity of each one varies according to the degree of symptom severity, being rated from 0-3(0 corresponds to mild or no symptoms; 3 corresponds to severe symptoms)[31]. The final score interpretation is given as follows, absence of depression between 0-13; mild depression between14-19; moderate between 20-28; and severe depression between 28-63.

Statistical Analysis

The collected data was entered in Microsoft excel spreadsheet. Mean (SD) was calculated for quantitative data. Descriptive statistics Including percentage and proportion was calculated for qualitative data. Chi-squared test was used for categorical data using

Statistical Package for Social Sciences (SPSS version 20). *P*<0.005 was considered statistically significant.

Observation and Result

During the study recruitment period, a total of 45 patients were enrolled for the treatment at our dialysis centre. Four patients did not meet the eligibility criteria and were excluded. Forty-one patients were judged eligible and agreed to fill the questionnaire.

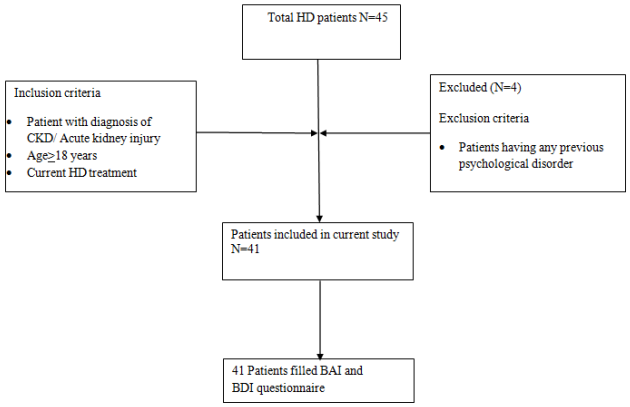

Fig. 1: Flow diagram of patient screened, included and evaluated for depression and anxiety level.

Sociodemographic and clinical characteristics of patients evaluated for depression and anxiety levels

The mean age was 47.73±14.63 years. The majority of the patients was males (56.07%), 41-60 years old (51.2%), of normal BMI (56.06%), literate (70.7%), on dialysis for less than 5 years (63.4%) and had serum albumin less than 3.5gm/dl (70.8%).

Table I: Sociodemographic and clinical characteristics of patients

Variables	No (%)
Gender	
Male	23(56.07)
Female	18.(43.9)
Age mean(SD)	47.73(±14.63)
Age groups(years)	
20-40	12(29.2)
41-60	21(51.2)
61-80	8(19.5)
Employment	
Employed	14(34.1)
Unemployed	27(65.8)
Education	
Illiterate	12(29.2)
Ilterate	29(70.7)
Residence	

Rural	30(75.6)
Urban	11(26.8)
Socio-economic status	
Lower	20(48.8)
Middle	21(51.2)
Marital status	
Married	31(75.6)
Unmarried	6(14.6)
Widowed	4(9.2)
BMI Mean(SD)	19.7(±2.7)
BMI classification	
Underweight	17(41.4)
Normal	23(56.06)
Overweight	1(2.4)
SBP	
<120	9(21.9)
120-139	16(39.02)
>140	16(39.02)
DBP	
<80	18(43.9)
80-89	10(24.3)
>90	13(31.17)
Hb	
<7	5(12.1)
7-9	9(21.9)
9.1-10.5	16(39)
Albumin	
<3.5	29(70.8)
>3.5	12(29.2)
DOD	
<5 years	26(63.4)
>5 years	15(36.5)

BMI-Body Mass Index; SBP-Systolic Blood Pressure; DBP- Diastolic Blood Pressure; Hb-Haemoglobin; DOD- Duration of Dialysis.

The mean age was 47.73±14.63 years. The majority of the patients were males(56.07%), 41-60 years old(51.2%), of normal BMI(56.06%), literate(70.7%),

on dialysis for less than 5 years(63.4%) and had serum albumin less than 3.5gm/dl(70.8%).

Table II: Socio-demographic and clinical determinants for depression(*N*=41)

Characteristics	Depression severity			*P*
	normal-mild	Moderate	Severe-extreme	
Gender				
Male	16(69.5%)	1(4.3%)	6(26%)	NS
Female	11(61.1%)	3(27.8%)	4(22.3)	
Age(years)				
Age mean(SD)	47.73(±14.63)			
20-40	8(56.7%)	2(16.6%)	2(16.6%)	NS
41-60	16(76.2%)	2(9.5%)	3(14.3%)	
61-80	0	3(37.5%)	5(62.5%)	
Employment				NS
employed	8(57.2%)	2(14.2%)	4(28.5%)	
unemployed	19(70.3%)	2(7.4%)	6(22.2%)	
Education				NS
Illiterate	8(66.7%)	0(0.0%)	4(33.3%)	
Literate	19(65.5%)	4(13.79%)	6(20.68%)	
Residence				NS
Rural	20(66.7%)	2(6.7%)	8(26.6%)	
Urban	7(63.7%)	2(18.2%)	2(18.2%)	
Socio-economic status				NS
Lower	13(65.0%)	2(10.0%)	5(25.0%)	
Middle	14(66.7%)	2(9.5%)	5(23.8%)	
Marital status				NS
Married	20(64.5%)	3(9.7%)	8(25.8%)	
unmarried	5(83.3%)	1(16.7%)	0	
widowed	2(50.0%)	0	2(50.0%)	
BMI				NS
underweight	9(52.9%)	2(11.8%)	6(35.2%)	
Normal	17(73.9%)	2(8.7%)	4(17.3%)	
overweight	1(100%)	0	0	
SBP				NS

<120	6(66.6%)	1(11.1%)	2(22.2%)	
120-139	11(68.8%)	2(12.6%)	3(18.8%)	
≥140	10(62.6%)	1(6.3%)	5(31.3%)	
DBP				NS
<80	11(61.1%)	5(27.8%)	2(11.1%)	
80-89	8(80.0%)	2(20.0%)	0	
≥90	8(61.6%)	0	5(38.5%)	
Hb				NS
<7	3(60%)	0	2(40%)	
7-9	5(55.5%)	3(33.3%)	1(11.1%)	
9.1-10.5	11(68.7%)	3(18.7%)	2(12.5%)	
Albumin				NS
<3.5	19(65.5%)	3(10.3%)	7(24.1%)	
≥3.5	8(66.7%)	1(8.3%)	3(25.0%)	
DOD				0.002
<5 years	21(80.8%)	4(15.3%)	1(3.8%)	
≥5years	6(40%)	9(60%)	0	

BMI-Body Mass Index; SBP-Systolic Blood Pressure; DBP- Diastolic Blood Pressure; Hb-Haemoglobin; DOD- Duration of Dialysis; NS- Not Significant.

The overall prevalence of depression in the sample was 63.4% in which 27 patients had normal-mild depression(65.9%),4 patients had moderate depression(9.7%) and 10 patients suffered from severe-extreme depression(24.4%).

Depression scores for socio-demographic and clinical variables are listed in Table-II.

It is observed that depression presents statistically significant association with duration of dialysis(*P*=0.002); Majority of the patients for less than 5 years on dialysis were normal or had mild depression(80.8%), whereas majority of the patients experienced higher levels of depression after five years(60%).

Other socio-demographic and clinical variables did not show significant correlation with depression.

Table III: Socio-demographic and clinical determinants for anxiety(*N*=41)

Characteristics	Anxiety severity			*P*
	Low	Moderate	Severe	
Gender				NS
Male	16(69.9%)	3(13.0%)	4(17.4)	
Female	10(55.6%)	5(27.83%)	3(16.7%)	

Age(years)				NS
Age mean(SD)	47.3(±14.63)			
21-40	8(66.7%)	3(25.0%)	1(8.3%)	
41-60	15(71.4%)	4(19.0%)	2(9.5%)	
61-80	3(63.4%)	1(19.5%)	4(17.1%)	
Employment				NS
Employed	9(64.3%)	3(21.4%)	2(14.3%)	
unemployed	17(63.0%)	5(18.5%)	5(18.5%)	
Education				NS
Illiterate	6(50.0%)	3(25.0%)	3(25.0%)	
Literate	19(65.5%)	6(20.6%)	4(13.7%)	
Residence				NS
Rural	20(66.7%)	5(16.7%)	5(16.7%)	
Urban	6(54.5%)	3(27.3%)	2(18.2%)	
Socio-economic status				NS
Lower	13(65.0%)	3(15.0%)	4(20.0%)	
Middle	13(61.9%)	5(23.8%)	3(14.3%)	
Marital status				NS
Married	18(58.1%)	6(19.4%)	7(22.6%)	
Unmarried	0	0	6(100.0%)	
Widowed	0	2(50%)	2(50%)	
BMI				NS
Underweight	8(47.1%)	5(29.4)	4(23.5)	
Normal	17(73.9%)	3(13.0%)	3(13.0%)	
Overweight	1(100.0%)	0	0	
SBP				NS
<120	4(44.4%)	3(33.3%)	2(22.2%)	
120-139	12(75.0%)	3(18.8%)	1(6.3%)	
≥140	10(62.5%)	2(12.5%)	4(25.0%)	
DBP				NS
<80	9(50.0%)	6(33.3%)	3(16.7%)	
80-89	10(100.0%)	0	0	
≥90	7(53.8%)	2(15.4%)	4(30.8%)	
Hb				NS

<7	3(60%)	2(40%)	0	
7-9	5(55%)	2(22.2%)	2(22.2%)	
9-10.5	12(75%)	3(18.75%)	1(6.25%)	
Albumin				NS
<3.5	21(72.4%)	3(10.3%)	5(17.2%)	
≥3.5	5(41.7%)	5(41.7%)	2(16.7%)	
DOD				0.004
<5 years	21(80.8%)	4(15.4%)	1(3.8%)	
≥5 years	5(33.3%)	4(26.7%)	6(40.0%)	

BMI-Body Mass Index; SBP-Systolic Blood Pressure; DBP- Diastolic Blood Pressure; Hb-Haemoglobin; DOD- Duration of Dialysis; NS- Not Significant.

The overall prevalence of anxiety was found out to be 36.6%. Anxiety scores for socio-demographic and clinical variables are listed in Table-III.

It is observed that as with depression, Duration of dialysis had a significant correlation with anxiety levels(P=0.004).

Other socio-demographic and clinical variables were not found to be significant.

Discussion

This study sought to determine the prevalence and predictors of anxiety and depression among ESRD patients on maintenance HD. In our study a total of 26 patients suffered from depression(63.4%) and 15 suffered from anxiety(36.6%).There is a lack of reliable data on direct comparisons between HD patients and the general population in the prevalence of depression and anxiety. However, when compared with the general population, patients with ESRD show more than five times the rate of suffering from depression[32].The prevalence of depression in our data was higher than in other studies, which have reported depression prevalence among ESRD patients ranging from 25.3% to 60.5%[33] with different scales used across different populations. This wide range in prevalences is likely attributable to two reasons, as reported by Bornivelli et al[34].First, depressive symptoms overlap with uremia symptoms. Second, different methods are used in different studies. Furthermore, the financial burden associated with HD therapy in India, loss of patient's job and loss of wages and time of the family members due to illness. All of these factors might be contributing to increased prevalence of depression in our study population.The findings of the present study suggest that the depressive symptoms and anxiety scores increased with increase in in the duration of the CKD and maintenance HD. Amira et al and Hedayati et al have reported similar findings.[35][36]The possible reasons for this finding could be lifelong dialysis therapy with atleast 2-3 dialysis per week and patients taking too much medicine at once. Keskin et al. revealed that depression is a risk factor for suicidal ideation and the chances of suicide attempts increasing with severity of depression. Therefore HD patients should be under regular psychiatric evaluation and all risk factors should be properly evaluated[21].In a study, significant association of depression with unemployment and hypoalbuminemia was found[37]. However in our study no significant correlation was found.Patient age showed no significant correlation with anxiety scores. Studies show that the older the patient, the higher the prevalence of somatic symptoms,

decreased quality of life, restrictions in social life and higher depression rates[38]. Corroborating this study, Bayat et al.[39] found no correlation between depression and patient age as well as gender.In our study, patient gender had no significant correlation with prevalence of anxiety or depression.In contrast to our finding of no significant association among male and female patients, a study conducted in the University of Michigan, female gender was a significant risk factor for depression[40].

On the other hand, in line with our finding no significant differences were observed in prevalence of depression among male and female patients in a study conducted in Turkey[41].

In our study all the participants belonged either to middle(51.2%) or low(48.8%) socio-economic status. In a study conducted elsewhere, an inverse relation was observed between depression and socio-economic status[42]. Similarly in other study depression was reported in study participants with middle and lower socio-economic status[43].

Of the total 31 married patients, 19(61.2%) patients had moderate and severe levels of depression. In contradiction to our study findings authors reported that depression was less common in married people which were undergoing dialysis therapy while widowed/divorced patients were at higher risk of depression[21].

Concerning limitations of the study, it is noted that patients were recruited from a single dialysis centre and the sample size was small.

Also, the fact that the study was cross-sectional is not allowing the emergence of a causal relationship between levels of anxiety and depression and socio demographic and clinical variables.

Conclusions

The primary focus of this study was to examine in a group of chronic renal disease patients on HD, the level of depression and anxiety and their association with the clinical and sociodemographic determinants. Depression and anxiety are highly prevalent mood disorders among patients undergoing hemodialysis, so they should be properly diagnosed and treated, to improve the quality of life of patients with CKD.

Duration of dialysis was found to be a significant predictor of depression and anxiety.

Early intervention in the treatment of depression would have a positive effect on the outcome of the disease.

Summary

Patients with CKD often have psychiatric difficulties in the form of depression and anxiety. Existing literature sheds light onto the specific impacts and mechanisms that psychiatric difficulties can influence CKD treatment and outcomes. Patients with certain social and clinical characteristics were found to be more prone to falling into depression.

The overall prevalence of depression was found to be 63.4% and that of anxiety was 36.6%.Duration of dialysis was a significant predictor for both anxiety(P=0.004) and depression(P=0.002).

Implementing systematic distress screening in routine clinical care would be an important first step, which should be performed in conjunction with providing appropriate interventions.

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