Depression in Patients Undergoing Hemodialysis at a Tertiary Care Hospital of Vidarbha

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Abstract
BACKGROUND: Depression is the most common and serious psychiatric disorder that affects patients with chronic kidney disease undergoing hemodialysis. Limited studies indicate an increase of psychiatric morbidity in them. **MATERIALS AND METHODS:** 57 CKD patients undergoing hemodialysis admitted in general medicine ward were interviewed using semi structured proforma, ICD - 11 criteria, HAM-D and BPRS scales. **RESULTS:** Depression was found in 52.63% of participants while 3 among them had significant scores on BPRS scale. **CONCLUSION:** Patients with longer duration of CKD and with longer duration of hemodialysis are more prone to depression as CKD has chronic debilitating course with poor outcome leading to occupational disturbance and financial implications.

Keywords: **Chronic Kidney Disease, Depression, Hemodialysis, Stress, Co-morbidity, Psychosis**.

INTRODUCTION

Chronic kidney disease (CKD) is rising as an important chronic disease which becomes a major life crisis for patients and their caregivers. Five major etiologies of CKD have been identified which include diabetic nephropathy, glomerulonephritis, hypertension associated CKD, autosomal dominant polycystic kidney disease, other cystic and tubulointerstitial nephropathy. All these causes collectively account for more than 90 % of the CKD disease burden worldwide.[1] The estimated prevalence of CKD in adults according to Third National Health and Examination Survey in the United States is 11% i.e., 19.2 million out of which prevalence in Stages 1, 2, 3, 4, and 5 was 3.3%, 3%, 4.3%, 0.2%, and 0.2%, respectively [2] while in Indian adults it has prevalence of 7%, 4.3%, 4.3%, 0.8%, and 0.8%.[3]

CKD patients experience multiple losses, including kidney function, family role, work role, sexual function, time and mobility. In addition to this, their quality of life is also affected by dietary restrictions, medication effects, fear of death and dependency on treatment. [4] Intense emotional distress is generated among patients and their families on diagnosis of CKD. Anxiety, depression, hostility, suicidal tendencies and other psychosocial problems are common in patients on chronic dialysis. Also, dementia, delirium,

psychosis, anxiety, and substance abuse are seen in such patients. [5]

Hemodialysis is the most sought treatment of CKD. Yearly around 55,000 patients undergo dialysis in India, and number of dialysis patients is increasing at the rate of 10–20% annually. [6] The process of dialysis makes a patient totally dependent on machine and medical personnel for 2 - 3 times per week resulting in significant physical, social, and psychological changes thus adversely affecting their quality of life leading to psychiatric morbidities.[7]

Depression in dialysis patients is often a result of combined psychological and social impairments associated with the treatment of end-stage renal disease (ESRD). [8] The most important underlying problem is suicidal ideation, and behavior of dialysis patients in depression. During earlier stages of dialysis, a patient may only be constrained to rest and dietary changes, but as the disease progresses, he may have difficulty in coping up his work resulting in absenteeism and hospitalization, thus affecting his finances. These physical and psychological stressors may lead to depression, suicide, psychosis and other psychiatric co

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morbidities. [9] With this background the present study was conducted with following aims and objectives:

1. To study depressive illnesses in patients undergoing hemodialysis

2. To study its correlation with sociodemographic and clinical profile of patients.

Inclusion criteria -

1. Adult patients of CKD undergoing hemodialysis.

2. Willing to give consent

3. Patient who were cooperative for interview and mental status examination.

4. Patients having no past history of any major psychiatric illnesses.

Exclusion criteria -

1. Those who refused to give consent.

2. Patients who were unable to participate in the study due to severity of physical illness.

3. Patients having history of alcohol use.

MATERIALS AND METHODS:

It was a cross sectional study which was conducted at a tertiary care teaching hospital of Vidarbha region over a period of 3 months. 57 patients undergoing hemodialysis in the dialysis unit of medicine department satisfying inclusion and exclusion criteria were included in the study. Semi structured proforma included socio-demographic profile, clinical examination & mental status examination. Psychiatric comorbidities were assessed by administering Brief Psychiatric Rating Scale (BPRS), Hamilton Depression Rating Scale (HAM-D) while psychiatric diagnosis was made on the basis of ICD – 11 criteria (International Classification of Diseases).

Data was collected and tabulated.

STASTITICAL METHODS:

Results were statistically analyzed using the Statistical Package for the Social Sciences version 26 (IBM, USA). Parametric data was analyzed using paired and unpaired t-test. Frequency data was analyzed using the Chi-square test. P value <0.05 was considered as statistically significant.

RESULTS:

Demographic and clinical characteristics of the patients are given in Table 1. 66.6% of the participants were in the age group of 41–60 years, 84.2% were males and 59.6% were having a monthly income <10,000 Rs. Out of 57, 30 patients had depression as a psychiatric co morbidity which was 52.63 %. Those patients of CKD who had depression

also had significantly higher age, significantly longer duration of CKD and significantly longer duration of dialysis as compared to that of CKD patients without depression. Depression was significantly higher in patients who were educated, who had lower income (<Rs. 10,000/month), however it was not associated with gender, occupation, and frequency of dialysis. (Table 5)

DISCUSSION:

1. Sociodemographic profile: [Table 1]

Age-wise distribution shows that 89.35% of patients were <60 years of age and 10.05% were >60 years. The reason for progression of renal failure may be due to delay in detecting renal diseases, late referral, and failure to introduce preventive measures. Gender-wise distribution showed that males were more likely to suffer from CKD than females. This is in agreement with the findings of an earlier Indian study by Suja et al., 2012. [10] In this study majority (64.9%) of the participants belonged from rural residential areas & though majority (59.64%) of them were educated but, literacy level of participants in this study was found to be significantly lower than overall literacy rate of Maharashtra state (82.9%).[11] This could be explained by the fact that majority of the participants in our study belonged from rural areas & even today most of rural population in our country remains uneducated. Majority (61.40%) of CKD patients on hemodialysis were unemployed which reflect the tremendous stress and strain that CKD patients are subjected to.

2. Illness details in patients on dialysis: [Table 1]

Majority (36.7%) of the patients had history of CKD since 11 months & more, followed by 35.08% of patients who had history of CKD since 0 – 5 months while rest (28.07%) of the patients had history of CKD since 6 – 10 months. As far as duration of dialysis was concerned, majority (45.6%) of the patients were on dialysis since >3 months followed by (29.8%) of the patients who were on dialysis since 1–3 months while rest (24.5%) were on dialysis since <1 month. Medical co morbidity wise distribution showed that around 85.9% of the patients had hypertension and 36.8% had diabetes mellitus. Since hypertension and diabetes are major contributing factors of renal failure so they should be managed properly in their initial stages only as lifelong treatment of renal failure along with diabetes and hypertension significantly increases the burden on such patients and worsens the prognosis of CKD. [10] Distribution of frequency of dialysis per week showed that majority (59.6%) of the patients underwent dialysis three times per week followed by 40.35 % patients who underwent dialysis two times per week.

3. Comparison of patients with depression and without depression according to HAM-D scores: [Table 2]

HAM-D wise distribution showed that more than half (52.63 %) of the patients in the study group were diagnosed with depression of which majority (50%) had moderate depression followed by 23.3% of the patients who had mild depression, 16.6% of the patients had severe depression while 10% of the patients had very severe depression. This finding was comparable with an earlier study by Hawamdeh et al., 2017 which showed 67% prevalence of depression in CKD patients undergoing dialysis.[12] Another study conducted on 69 patients with ESRD found the prevalence of depression to be 46%.[13] Similarly, high prevalence of depression was found in various studies conducted globally that reported 30% to 40% prevalence of depression in CKD patients undergoing dialysis.[5] In another comparative study fraction of patients with depression had greater prevalence among hemodialyzed patients.[14] Thus, findings on depressive illness from our study was found to be analogous with these studies. As more participants in our study belonged in the age group of 40 - 60 years and had CKD in stage-3 and above, hence the severity of CKD could also be the probable reason for high prevalence of depression. However, in our study, nearly half (47.36%) of CKD patients had no depression as per HAM -D scores.

4. Correlation of age, duration of CKD& duration of dialysis in patients with and without depression: [Table 3]

Correlation of age according to presence and absence of depression showed a significant association (p value=0.001) between age of the participants and presence of depression. These findings show that as age group increases from 21- 40 to 41- 60 years, the risk of depression also increases. This was in relation with a study conducted by Gupta et al., 2018 where mean age of participants having depression was between 45-55 years of age.[15] Similarly, correlation between duration of CKD with presence and absence of depression showed a significant association (p value =0.044) between duration of CKD and presence of depression. This may be a result of increased financial costs due to treatment, multiple hospitalizations and CKD related psychological factors. Kimmel et al., 2002 also found similar observations in his study.[16] In the same way correlation between duration of dialysis with presence and absence of depression showed a significant association (p value =0.016) between duration of dialysis and presence of depression. These findings show that longer duration of dialysis procedure itself could be distressing for the patient as this single factor can act as a major psychological stressor out of many other stressors that precipitate depression in these patients.

5. MSE findings in CKD patients having depressive illness: [Table 4]

In our study on MSE, every 3rd patient having depression reported suicidal ideations [Table 4]. These findings were comparable to a meta-analytic study conducted by Pompili et al., 2013 [17] which reported suicidal ideations were common findings in patients on dialysis having depression. Hence, presence of suicidal ideation is pathognomonic of depression. Similarly, passive death wishes were reported by 53.3% of patients with depression, ideas of hopelessness/helplessness/worthlessness were present in 66.6% of patients while significant (83.3%) patients reported pre-occupation with worries. Such high percentages of above findings are strong predictors of depression. The morbidity of late-life depression on physical health, social support systems, and general functioning is significant, making depression a major cause of disability in older adults and a risk factor for suicide as well. (18)

6. Correlation of sociodemographic and other clinical variables of dialysis patients with and without depression [Table 5]

In the study, gender of the participants was correlated with and without depression, but it was not found to be statistically significant (p value= 0.103). Ramasubramanian V et al., 2015 also found similar observations in his study [19]. However, two-fold greater prevalence of depression is found in women than men.[20]

When educational level of the participants was correlated with and without depression it was found to be statistically significant (p value= 0.012). In our study it was seen that majority of CKD Patients having depression were educated. This could be due to the fact that educated people understand the consequences and long-term morbidity of their illness better than the uneducated thus making them susceptible for depression as compared to uneducated. Another factor that could be at play is educated individuals hold high income jobs and are major earners in the family, and chronic illnesses like CKD can significantly affect their bio-psycho-social functioning which can lead to major depression.

Correlation of occupation of participants with and without depression showed no statistical significance (p value = 0.556). This was in accordance with study conducted by Rosa CS et al., 2015 in which younger patients, despite undergoing hemodialysis therapy, maintained their occupational activities, resulting in higher levels of physical activity as compared to elderly patients on hemodialysis. [21]

On comparing monthly income of CKD patients with and without depression, it was found to be statistically significant (p value=0.002). This showed that income of the patients does play a role in pathogenesis of depression. This could be explained by the fact that majority of people with

lower income had participated in our study as our tertiary hospital is located in a peripheral region. Ahlawat et al., 2018 also had similar findings as far as income of CKD patients & depression was concerned. [22]

Significant correlation found when suicidal ideations were correlated with depression (p value=0.0009) which was similar to a study by keskin et al., 2011. This suggests that presence of suicidal ideation is a direct predictor of depression. [23]

No statistical significance was found when frequency of dialysis was correlated with and without depression. This showed that frequency of dialysis had no effect on the presence or absence of depression which was in relation to a study by Kim et al., 2002 [24]

7. BPRS scores of patients with depression: [Table 6]

10% of patients having depression showed significant scores (>50) on BPRS scale and they scored high in the anxiety, depression and psychotic subscales. Such high scores on BPRS may indicate presence of prodromal psychosis in such patients. However, in one study 11 patients (33%) scored 22 or more points on the Brief Psychiatric Rating Scale (BPRS) but the abnormal scores were only in the depression and anxiety subscales. There was no abnormal score in the psychotic subscales. [25]

It is likely that increasing use of hemodialysis will be accompanied by an increasing number of psychotic reactions. Symptoms will vary from a classic organic brain syndrome with symptoms such as confusion, disorientation, and memory loss, to syndromes resembling an acute schizophrenic episode (but usually without a classic "thought disorder" such as ambivalence, autism or the like), or psychotic depression with symptoms such as depression or ideas of reference. These signs and symptoms can occur in the absence of biochemical abnormalities. [26]

Uremic encephalopathy is a consequence of renal failure (RF Changes in sensorium include loss of memory, impaired concentration, depression, delusions, lethargy, irritability, fatigue, insomnia, psychosis, stupor, catatonia, and coma).[27]

CONCLUSIONS:

From the above study we concluded that CKD patients undergoing hemodialysis had increased incidence of depression and males in the age group of 41–60 years were more common victims of depression. 52.63 % patients of CKD undergoing hemodialysis had depression, while 10% of participants having depression had BPRS scores >50, they also had high prevalence of suicidal ideations and passive death wishes. This may signify that CKD patients undergoing hemodialysis are having depression as psychiatric manifestation in significant number that should

be taken care of. Patients with long standing dialysis as well as having longer duration of CKD were more prone to develop depression.

FUTURE IMPLICATIONS:

1. Role of non-pharmacological modalities like Cognitive-Behavior therapy, regular exercise and relaxation techniques along with antidepressants can be effectively used for reducing depression in such patients.

2. Effective psychoeducation of family members about monitoring depressive symptoms in such patients can improve prognosis of depressive illnesses and other psychiatric comorbidities in them.

3. Early psychiatric evaluation of psychiatric comorbidities should be done in these patients so as to reduce the severity of psychiatric symptoms and improve their quality of life.

LIMITATIONS:

1. The study was conducted in a tertiary care teaching hospital located in a peripheral region; hence its findings cannot be generalized.

2. Sample size of this study was comparatively smaller than similar studies conducted globally

3. The effect of various stages of CKD on depression could not be studied as all patients in the study were in Stage III of CKD.

4. This was a cross-sectional study; a prospective longitudinal study of cohorts would result in better comprehensive findings.

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TABLES:

(TABLE 1) Demographic characteristics of chronic kidney disease patients undergoing hemodialysis

Sr. no.	Factors		Frequency (N=57)	Percentage (%)	
1.	Gender	Male	48	84.2%	
		Female	09	15.7%	
2.	Age groups(years)	<20	01	1.7%	Mean age 49.85 SD = 11.546
		21-40	12	21.05%	
		41-60	38	66.6%	
		>60	06	10.5%	
3.	Education	Uneducated	23	40.3%	
		Primary	07	12.2%	
		Secondary	06	10.5%	
		Higher secondary	12	21.05%	
		Graduate	05	8.7%	
		Postgraduate	04	7.01%	
4.	Occupation	Unskilled	02	3.5%	
		Semiskilled	05	8.7%	
		Skilled	15	26.3%	
		Unemployed	35	61.4%	
5.	Monthly income (Rs)	<10,000	34	59.6%	
		>10,000	23	40.3%	
6.	Marital status	Married	48	84.2%	
		Single	05	8.7%	

		Separated	01	1.7%	
		Widowed	03	5.2%	
7.	Residential Background	Rural	37	64.9%	
		Suburban	14	24.5%	
		Urban	06	10.5%	
8.	Co morbid physical disorders	Hypertension	49	85.9%	
		Diabetes mellitus	21	36.8%	
		Thyroid disorders	03	5.2%	
9.	Duration of CKD (months)	0-5	20	35.08%	
		6-10	16	28.07%	
		11-15	11	19.2%	
		>15	10	17.5%	
10.	Frequency of dialysis (per week)	Two / week	23	40.35%	
		Three / week	34	59.6%	
11.	Duration of dialysis(months)	< 1	14	24.5%	
		1-3	17	29.8%	
		> 3	26	45.6%	

TABLE 2

HAM D scores of all chronic kidney disease patients undergoing hemodialysis

HAM-D	Total CKD patients (N = 57)	CKD patients having Depression (N = 30)
0-7 (normal)	27(47.36%)	0(0)
8-13 (mild)	07(12.28%)	07(23.33%)
14-18 (moderate)	15(26.31%)	15(50%)
19-22 (severe)	05(8.77%)	05(16.6%)
>22 (very severe)	03(5.26%)	03(10%)
Total	57(100%)	30(100%)

TABLE 3

Correlation of age, duration of chronic kidney disease and duration of dialysis in patients with and without depressive illness

Parameter	Depression (Mean + SD)		P value
	Present N=30	Absent N=27	
Age	47.59+ 11.072	35.69+14.478	0.001 (S)
Duration of CKD (months)	13.69+14.524	7.97+7.106	0.044 (S)
Duration of dialysis(months)	8.144+8.0763	3.834+5.1183	0.016 (S)

TABLE 4

Severity of depressive illness and mental status examination findings in chronic kidney disease patients undergoing hemodialysis

PSYCHIATRIC COMORBIDITY(N=30)	Number of cases (%)
Mild depressive episode	07(23.33)
Moderate depressive episode	15(50)
Severe depressive disorder	05(16.6)
Very severe depressive disorder	03(10)
No depression	27(47.36)
DURATION OF PSYCHIATRIC ILLNESS (MONTHS)	
< 1	09(30)
1-3	11(36.6)
> 3	10(33.3)
MENTAL STATUS EXAMINATION	
Suicidal ideation	
Present	10(33.3)
Absent	20(66.6)

PASSIVE DEATH WISHES	
Present	16(53.3)
Absent	14(46.6)
IDEAS OF HOPELESSNESS/HELPLESSNESS/WORTHLESSNESS	
Present	20(66.6)
Absent	10(33.3)
PREOCCUPATION WITH WORRIES	
Present	25(83.3)
Absent	05(16.6)

TABLE 5

Correlation between socio demographic & clinical variables in CKD patients with& without depression undergoing hemodialysis

Sociodemographic& clinical variables	Depression		Total (N=57)	$\chi 2$	P value
	Present N=30	Absent N=27			
GENDER					
Male	28	20	48	2.6481	0.103677
Female	02	07	09		(NS)
EDUCATION					
Illiterate	07	16	23	6.2007	0.01277
Educated	23	11	34		(S)
OCCUPATION					
Employed	10	12	22	0.3457	0.55658
Unemployed	20	15	35		(NS)
INCOME (RS)					
<10,000	24	10	34	9.186	0.002439
>10,000	06	17	23		(S)
SUICIDAL IDEATIONS					
Present	10	0	10		0.0009

Absent	20	27	47	FISHER EXACT TEST	(S)
FREQUENCY OF DIALYSIS					
Two / week	09	14	23	1.9844	0.158924
Three / week	21	13	34		(NS)

TABLE 6

BPRS scores of patients with depression.

BPRS scores	Depression patients, N = 30(%)
<50	27(90)
>50	03(10)
Total	30(100)