

Psychiatric Morbidities, Caregiver's Burden and Quality of Life in Chronic Kidney Disease Patients Who Were Recently Initiated on Maintenance Hemodialysis and Who Were Already on Maintenance Hemodialysis - A Comparative Study

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Abstract: Background: Patient's with Chronic kidney disease undergoing maintenance hemodialysis are at increased risk of psychiatric morbidity, impaired quality of life and increased caregiver's burden, but there is limited evidence is available comparing these factors along with duration of treatment. Aim: To assess and compare psychiatric morbidities, quality of life and caregivers burden among patients recently initiated on maintenance hemodialysis (<6 months) and already on maintenance hemodialysis (> 6 months) Methodology: This crosssectional study was conducted in tertiary care hospital among 50 participants in each groups. For assessment of psychiatric morbidities, Hamilton rating scale for depression, Hamilton rating scale for anxiety, Yale brown obsessive compulsive scale and Brief psychiatric rating scale were used. Quality of life was evaluated using World health organization quality of life brief version- Hindi version. To assess caregiver's burden, Family burden interview schedule (FBIS) was used. Results: In the patients who were recently initiated on maintenance hemodialysis depression (87%) and anxiety (90%) is significantly prevalent, patient's receiving maintenance hemodialysis for more than 6 months demonstrate poor quality of life in domains of physical and psychological health is seen and their caregiver's also experienced high caregiver burden. Conclusion: Chronic kidney disease and maintenance hemodialysis adversely affect both the physical and mental health and well being of patients, so a multidisciplinary approach incorporating psychiatric and psychosocial support may improve long term outcomes.

Keywords: Chronic kidney disease, Hemodialysis , psychiatric morbidities, quality of life and caregiver's burden

1. Introduction

Chronic Kidney Disease (CKD) affects 10–14% of the global population⁽¹⁾. It is defined as persistent structural or functional renal abnormalities or an eGFR <60 mL/min/1.73m² for ≥3 months, often progressing to dialysis or transplantation⁽²⁾. As per Goyal et al. prevalence of stages 1–5 in India is 7%, 4.3%, 4.3%, 0.8%, and 0.8% respectively⁽³⁾. CKD imposes a significant psychosocial burden affecting family, work, relationships, mobility, and mental health⁽⁴⁾. Dialysis is a critical form of renal replacement therapy (RRT), is vital for patient suffering from acute kidney injury or chronic kidney disease⁽⁵⁾. According to a 2018 estimate, there are around 1,75,000 chronic dialysis patients in India, with an prevalence of 129 per million people^(6,7). Psychiatric morbidities are common in patients with CKD and it affects individual's functioning and causes significant stress⁽⁸⁾. Patients with CKD had a prevalence of anxiety and depression of 21.4% to 22.8% and 24.8% to 34.3%, respectively⁽⁹⁾, and in patients on hemodialysis (HD) prevalence of anxiety and depression is 20-45% and 25-50% respectively⁽¹⁰⁾. Prevalence of delirium in HD is 12- 15%⁽¹¹⁾, adjustment disorder in HD is 6-12%⁽¹²⁾, alcohol use in HD is 20-36%⁽¹³⁾, psychosis in HD is 0.6 %⁽¹²⁾. Patients are more susceptible to psychiatric morbidities because of their dependence on others, frequent dialysis, ongoing treatment expenses, and uncertainty about their prognosis, all of which lead to distress⁽⁹⁾. Quality of life (QOL) is a concept that is used to describe the well-being of both individuals and populations with respect to both positive and negative aspects of their existence at a given point in time⁽¹⁴⁾. Physical, psychological and social functions changes are seen in CKD

patients, among all the affected domains in QOL, the most affected one is physical functioning in HD patients as stated by Aggarwal et al.⁽¹⁵⁾. Caregivers often suffers from stress and are at risk of caregiver burden which further impact their mental as well as physical health^(16,17). In HD patients caregivers there is risk of developing distress either emotional or psychological along with low quality of life, financial problems, increase workload and feeling of helplessness⁽¹⁸⁾. Earlier studies has shown that psychiatric morbidities, poor quality of life and high caregiver's burden are seen in patients undergoing HD, but there is no demarcation of these morbidities with duration of HD and head to head comparison, hence the present study has been undertaken to assess and compare psychiatric morbidities, quality of life and caregiver's burden in patients who are recently initiated on maintenance HD (less than 6 months) and who are already on maintenance HD (more than 6 months).

2. Material and Methods

This is a cross sectional comparative study, conducted in a tertiary care centre in Southern Rajasthan. Before starting the study, approval from Institutional research review committee (IRCC) and institutional ethics committee (IEC) was taken. This study was conducted between July 2023 to December 2024. Two groups of patients (recently initiated on Maintenance Hemodialysis (MHD) and already on Maintenance Hemodialysis (MHD) were recruited by consecutive sampling technique from outpatient and indoor patients from department of nephrology, after examined by consultant nephrologist and diagnosis of CKD was made on the basis of ICD 10 criteria.

Sample size calculation: Prevalence of chronic kidney disease is 10-15% in general population⁽¹⁾, According to this prevalence rate, considering the allowable error of 10% at a 95% confidence interval thus the sample size was calculated by using

$$n = \frac{(Z)^2 \times p \times (1 - p)}{E^2}$$

$$n = \frac{(1.96)^2 \times 0.15 \times (1 - 0.15)}{0.102}$$

$$n = 48$$

Minimum sample size required in each group is 48 patients. There were two groups of 50 patients each, one group of patients who were recently initiated on MHD (< 6 months) and second group of patients who were already on MHD (> 6 months).

Inclusion Criteria:

- Patient in age group of 18-60 years, of both genders.
- Patient who are diagnosed with chronic kidney disease undergoing MHD.
- Patients recently initiated on MHD (< 6 months of duration)
- Patients who are already on MHD (> 6 months of duration)
- Patient and caregiver's willing to participate in the study after giving written informed consent.

Exclusion criteria:

- Patient with pre existing psychiatric disorders and substance use disorder prior to putting on MHD.
- Patient who could not communicate verbally and had intellectual disability.
- Patient requiring intensive care management.
- Patient who are not medically stable i.e. altered sensorium/delirium/ uremic encephalopathy/dementia, etc.

Procedure

Patient's and caregivers assessment was done before the dialysis procedure after taking written informed consent, interview and assessment of patients and caregivers was conducted by psychiatry resident using following scales :

- 1) Semi structured Performa - The data for sociodemographic and clinical profile were obtained through the administration of semi- structured proforma which was specially designed for the present study.
- 2) Hamilton Rating Scale For Depression (HAM-D)- It is used to assess depression among patients. Patient is evaluated on the first 17 questions of the 21-question scale that was employed in this study. The patient is evaluated using a 5-point Likert-type scale or a 3-point one. Additional information is obtained from the last four questions. A score of 0-7 is regarded as normal. Mild depression is defined as score between 8- 13, moderate as 14-18, severe as 19-22, and very severe as >23.
- 3) The Hamilton Rating Scale For Anxiety (HAM-A)- It is used to assess anxiety among patients. The 14 items on the scale, each of which is characterised by a set of

symptoms, assess somatic anxiety (physical ailments associated with anxiety) as well as psychic anxiety (mental agitation and psychological discomfort). Each item is given a score between 0 (not present) and 4 (severe), with a total score between 0 and 56. A score of less than 17 denotes mild anxiety, 18 to 24 mild to moderate anxiety, and 25 to 30 moderate to severe anxiety.

- 4) Brief Psychiatric Rating Scales (BPRS)- It is used to assess psychosis among patients This scale was developed for rapid assessment particularly for evaluation of patient change. It is 18 item scale, uses 7 items Likert scale with undermentioned values: 1 = "not present", 2 = "very mild", 3 = "mild", 4 = "moderate", 5 = "moderately severe", 6 = "severe", 7 = "extremely severe".
- 5) Yale Brown obsessive and Compulsive Scale (YBOCS)- It is used to assess obsessive compulsive disorder among patients. It is 10 item clinician rated measure, includes first 5 items to evaluate obsessions and next 5 items to assess compulsion related questions. Total scores for obsessions and compulsions range from 0 to 20, while the overall total scores range from 0 to 40. each item has a set of item-specific anchors that are scored from 0 (no symptoms) to 4 (severe symptoms).
- 6) Family burden interview schedule (FBIS)- It is semi structured interview schedule used to assess caregiver burden among family members/caregivers of patients. it is 26 item scales, the first 24 items of the original FBIS were separated into six categories: financial burden, disruption of family contact, effect on others' physical health, and effect on others' mental health. The 25th item is a supplemental question that asks about any additional family burden that was not covered in the first 24 items. The 26th item is a subjective burden assessment that asks the standard question, "How much would you say you have suffered owing to patient's illness?" using a three-point Likert scale has 0 for no burden, 1 for moderate burden, and 2 for severe burden
- 7) World Health Organisation- Quality of Life BREF version (WHOQOL-BREF) (Hindi)- It is used to assess overall quality of life among patients. It encompasses 24 facets universally, and four general questions that address overall quality of life and health. These 24 facets can be most appropriately grouped into four domains: physical, psychological, social relationships and environment.

Statistical analysis:

The data obtained was entered into Microsoft Excel for iOS . Categorical variables were expressed as percentages; continuous variables were expressed as mean (+/- Standard Deviation). All analyses were performed at 95% confidence interval and two-tailed p value <0.05 was considered statistically significant.

Unpaired t-test were used according to data distribution, conclusions were drawn and tabulated.

3. Results

Table 1: Comparison of Sociodemographic Variables of Patients Recently Initiated on Maintenance Hemodialysis and Already on Maintenance Hemodialysis

Sociodemographic Variables		Group of Patient on Hemodialysis		p value
		<6 Months N = 50(%)	> 6 Months N = 50(%)	
Age (Years)	Mean $\pm$ S.D	47.55 $\pm$ 10.18	50.09 $\pm$ 9.63	0.203*
	18-39	17 (34%)	16(32%)	0.832*
	40-60	33(66%)	34(68%)	
Sex	Male	36 (72%)	32 (64%)	0.391*
	Female	14(28%)	18(36%)	
Education	Primary School	8 (16%)	7(14%)	0.427*
	Secondary School	10 (20%)	10(20%)	
	Plus 2 Graduate	6 (12%)	12 (24%)	
	Graduate	18(36%)	13(26%)	
	Postgraduate	8(16%)	8(16%)	
Relationship Status	Single	6 (12%)	4(8%)	0.868*
	Married	34 (68%)	36 (72%)	
	Separated	2 (4%)	3(6%)	
	Divorced	8(16%)	7(14%)	
Occupation	Unskilled Labourer	1(2%)	4 (8%)	0.360*
	Skilled Labourer	9(18%)	12(24%)	
	Government Employee	6(12%)	5 (10%)	
	Private Employee	14(28%)	17(34%)	
	Self Employed	7 (14%)	5(10%)	
	Business	6(12%)	1(2%)	
	Others	7(14%)	6(12%)	
Location Of Residence	Urban	27(54%)	27(54%)	1*
	Rural	23(46%)	23(46%)	
Type Of Family	Nuclear	24(48%)	27(54%)	0.608*
	Joint	19 (38%)	19(38%)	
	Extended	7 (14%)	4(8%)	
Socio Demographic Profile	Upper	4 (8%)	1(2%)	0.375*
	Upper Middle	15(30%)	12(24%)	
	Lower Middle	18(36%)	19(38%)	
	Upper Lower	6(12%)	12(24%)	
	Lower	7(14%)	6(12%)	

* p value > 0.05 (not significant): S.D- Standard Deviation

Table 2: Comparison of psychiatric morbidity of Patients Recently initiated on Maintenance Hemodialysis and Already on Maintenance Hemodialysis

Psychiatric Morbidity Scores		Group of Patients on Hemodialysis		p Value
		<6 Months N = 50(%)	>6 Months N = 50(%)	
HAM D	(Mean $\pm$ S.D)	15.36 $\pm$ 3.90	11.91 $\pm$ 4.98	<0.001**
HAM A	(Mean $\pm$ S.D)	19.18 $\pm$ 5.98	13.09 $\pm$ 5.61	<0.001**
BPRS	(Mean $\pm$ S.D)	25.26 $\pm$ 4.55	22.38 $\pm$ 4.10	0.251
YBOCS	(Mean $\pm$ S.D)	1.00 $\pm$ 0.33	1.00 $\pm$ 0.37	1

**p value <0.001= highly significant, HAM- A Hamilton anxiety rating scale; HAM- D Hamilton depression rating scales; BPRS – Brief psychiatric rating scale; YBOCS- Yale brown obsessive compulsive scale

Table 3: Comparison of Caregivers Burden in Patients Recently initiated on Maintenance Hemodialysis and Already on Maintenance Hemodialysis

Caregiver Burden		Group of Patients on Maintenance Hemodialysis		p Value
		<6 Months N = 50(%)	>6months N = 50(%)	
FBIS	Mean $\pm$ S.D	15.82 $\pm$ 6.53	25.88 $\pm$ 6.00	<0.001**
	Mild (0-16)	30 (60%)	3(6%)	<0.001**
	Moderate (17-32)	18(36%)	42(84%)	
	Severe (33-48)	2(4%)	5(10%)	

*p value <0.05 is significant; FBIS – Family burden interview schedule

Table 4: Comparison of Quality of Life QOL) in Patients Recently initiated on Maintenance Hemodialysis and Already on Maintenance Hemodialysis

WHO QOL BREF		Group of Patients on Maintenance Hemodialysis		p Value
		<6 Months (N = 50) Mean $\pm$ S.D	> 6 Months (N = 50) Mean $\pm$ S.D	
Physical Health		49.02 $\pm$ 6.54	46.03 $\pm$ 6.99	0.030*
Psychological Health		46.40 $\pm$ 7.87	43.32 $\pm$ 8.10	0.143
Social Relations		58.60 $\pm$ 7.15	54.52 $\pm$ 7.95	0.008*
Environment		56.22 $\pm$ 7.43	51.47 $\pm$ 6.51	0.001**
Total		53.03 $\pm$ 3.37	50.37 $\pm$ 3.01	0.037*

*p value < 0.05 is significant and **p value < 0.01 is highly significant; WHOQOL BREF – World health organisation Quality of life brief questionnaire

Table 1 shows Sociodemographic profile comparison among both groups of patients i.e. < 6 months of MHD duration and > 6 months of MHD duration, in both groups no statistically significant difference was found. Psychiatric morbidity comparison in Table no.2 shows that difference in both the groups of < 6 months of MHD and > 6 months of MHD is statistically significant in depression and anxiety, mean score of depression assessed by HAM D is 15.36 ± 3.90 (< 6 months of MHD duration) and 11.91 ± 4.98 (> 6 months of MHD duration) and mean score of anxiety assessed by HAM-A is 19.18 ± 5.98 , (< 6 months of MHD duration) and 13.09 ± 5.61 (> 6 months of MHD duration), Comparison of caregivers burden in Table no 3 shows that high caregivers burden is seen in pts with > 6 months of MHD, mean score of caregivers burden assessed by FBIS is 15.82 ± 6.53 (< 6 months of MHD duration) and 25.88 ± 6.00 (> 6 months of MHD duration), the difference between both the groups is statistically significant and Comparison of quality of life in Table no 4 shows that poor quality of life is seen in patients with > 6 months of MHD, as compared to patients in > 6 months of MHD duration, the difference between both the groups is statistically significant, mean score in < 6 months of MHD is 53.03 ± 3.37 and in > 6 months of MHD duration is 50.37 ± 3.01 .

4. Discussion

The present study was conducted to assess psychiatric morbidities, quality of life and caregiver's burden among patients with chronic kidney disease on hemodialysis attending tertiary care hospital. In the present study the mean age of patients with < 6 months of MHD duration is 47.55 (S.D ± 10.18). This findings was consistent with previous study done by **Abdullah et al.** ⁽¹²⁾ in which mean age of participants is 47.43 (SD of ± 13.87) and the mean age of patients with > 6 months of MHD duration is 50.09 (SD of ± 9.63) which is consistent with **Puneet et al.** ⁽¹⁹⁾ study in which mean age of participants is 50.5 (SD of ± 10.32).

In the present study it was observed that depression is present in 87% of patients. These findings are consistent with previous studies done by **Sarvanan et al.** ⁽²⁰⁾ in which 74 % participants had depression and **Jarapula et al.** ⁽²¹⁾ in her study reported 79% of chronic kidney disease patient on dialysis had depression. In the present study severity of depression is more in group of patients who were recently initiated on MHD (< 6 months), this finding is similar to **Vermani et al.** ⁽²²⁾ study which reports the similar findings that the prevalence of psychiatric morbidity is more in individuals who are recently initiated on MHD (< 6 months). The findings of the study highlights that significant psychological burden during the initial phase of HD due to adjustment difficulties, lifestyle adaptations, increased psychological distress due to treatment modality and uncertainties regarding prognosis and over time patients may develop better psychological adaption and coping mechanisms, leading to reduction in depressive symptoms.

The present study revealed higher anxiety levels among participants with < 6 months of MHD duration as compared

to group who were already on MHD. These findings are similar to **Saravanan et al.** ⁽²⁰⁾ which shows that 59% participants has some form of anxiety and 13 % has severe anxiety and similarly in the study by **Puneet et al.** ⁽¹⁹⁾ shows that 61 % participants has mild to moderate form of anxiety and 39% has severe form of anxiety. The findings of the present study reveals that in the initial phase of HD patients experience higher level of anxiety due to uncertainty about prognosis, treatment complications, psychological stress all of which contributes to higher anxiety levels and in this study anxiety tends to reduce with time, suggesting possible psychological adaptation to treatment and illness.

In the present study psychosis and obsessive compulsive disorder is not seen among participants in both the groups. Similar observations were seen in studies conducted by **Kalra et al.** ⁽²³⁾, which concluded that among the psychiatric morbidity depression is more prevalent than any other psychiatric disorder and **Elhadad et al.** ⁽²⁴⁾ reports of no manic, hypomanic, phobic and OCD in their study participants, contrary to present study a study conducted by **Jadhav et al.** ⁽²⁵⁾ shows that 6.2 % participants has psychosis.

In the present study high caregiver burden is seen among the caregiver of patients who were already on maintenance hemodialysis as compared to patients who were recently initiated on hemodialysis, these findings were similar to previous study done by **Bonthu et al.** ⁽²⁶⁾ in their study around 54% of caregivers reports moderate to severe burden and 36% reports mild to moderate level of caregiver burden, **Chhetri et al.** ⁽¹⁸⁾ also reported that caregiver burden is high among caregivers of HD and **Jadhav et al.** ⁽²⁵⁾ reports of 54% caregiver burden among participants, contrary to all of these studies a study by **Pio et al.** ⁽²⁷⁾ reports of no or minimal caregiver burden in his study. The present study result highlights that with increase in duration of MHD, caregiver's burden increases, due to disruption in caregivers life because of patients chronic illness, financial burden, emotional fatigue from prolonged caregiving and increased dependency of patient on caregiver are some of the possible reasons for this findings.

In the present study poor quality of life is seen in patients who were already on maintenance hemodialysis as compared to patients who were recently initiated on maintenance hemodialysis. These findings are similar to previous study which were conducted to assess quality of life in patients of CKD on MHD, a study by **Sathvik et al.** ⁽²⁸⁾ states that quality of life is significantly impaired in MHD patients as compared to healthy individuals, they also reported that quality of life score is better in environment and social relation domains as compared to physical and psychological domains similar to the findings of present study and **Anees et al.** ⁽²⁹⁾ states that duration of dialysis had an negative impact on quality of life, which is also present in this study as lower quality of life is seen in patients > 6 months of MHD duration factors contributing to this decreased quality of life is treatment fatigue, financial problems, increased dependency on others, less social support and other medical comorbidities.

5. Conclusion

Chronic kidney and maintenance hemodialysis profoundly impact physical health as well as mental health, quality of life and caregivers well-being. In the initial stages of dialysis psychiatric morbidity is more and this burden gradually shifted towards increased caregivers strain and start impacting the components of quality of life in patients. Psychiatric morbidity i.e. depression and anxiety is significantly present in patients with < 6 months of MHD duration as compared to patients with > 6 months of MHD duration whereas low quality of life in patients and high caregivers burden in caregivers of patients is observed in > 6 months of MHD duration, as with increase in duration of dialysis time, dependency on family members increases, caregivers fatigue and burden. Patients who were diagnosed with psychiatric morbidity in this study were provided psychiatric interventions and these findings emphasize the need to adopt multidisciplinary care models in chronic kidney disease patients and regular psychological screening of patients and their caregivers to reduce psychiatric morbidities and caregivers burden.

6. Strengths and Limitations

Comparative cross-sectional design of study to assess and compare patient's psychiatric morbidity, quality of life and caregiver's burden on the basis of duration of hemodialysis, multidimensional assessment of these parameters by using validated and reliable scales are strengths of the study.

Cross sectional design of study made it difficult to comment on cause and effect relationships. Use of consecutive sampling in the study, can produce selection bias. This study sample is limited to single centre, therefore the results may not be generalized to multiple centres. Important confounding factors such as medical comorbidities, coping mechanisms, family dynamics and medication use in patients were not taken into account. Self-reported scales which were used in the study may carry the social desirability bias, caregiver's burden was assessed in the study but the sociodemographic variables and psychological assessment of caregiver's weren't separately assessed in the study.

Conflicts of interest: Nil

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