Psychiatric comorbidity in patients undergoing hemodialysis

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ABSTRACT

Background: Patients undergoing hemodialysis are under considerable physical and mental stress. Few studies indicate an increase of psychiatric morbidity in them.

Aim: The aim is to study the prevalence of psychiatric comorbidity in patients undergoing hemodialysis.

Materials and Methods: A total of 49 consecutive patients of chronic kidney disease undergoing hemodialysis were included in the study with their consent. The Institute Ethics Committee clearance was obtained before the start of the study. Patients were assessed using the Schedule for Clinical Assessment in Neuropsychiatry and Hamilton rating scale for depression.

Results: A total of 49 patients in the age range of 15–64 years were included in the study. Majority of the sample was males (75.5%). Out of the patients enrolled in the study group, 45% had psychiatric comorbidity which included depression (26%), adjustment disorder (12.2%), generalized anxiety disorder (2%), mixed anxiety and depression (2%), and mental and behavioral disorders due to harmful use of alcohol (2%) indicating that patients undergoing hemodialysis is more likely to have mood disorder than other psychiatric disorders.

Conclusion: Patients with recent-onset dialysis are more prone to psychiatric illnesses as it has a chronic debilitating course with poor outcome leading to major lifestyle changes with occupational disturbance and consequent financial implication.

Keywords: Alcohol dependence, chronic kidney disease, depression, generalized anxiety disorder, hemodialysis, mixed anxiety and depressive disorder, psychiatric co-morbidity

Any chronic illness is a potential life crisis for patients and their family. Chronic kidney disease (CKD) is emerging as an important chronic disease globally.[1] The Third National Health and Examination Survey estimated the prevalence of CKD in adults in the United States as 11% (19.2 million) out of the prevalence in Stages 1, 2, 3, 4, and 5 was 3.3%, 3%, 4.3%, 0.2%, and 0.2%, respectively.[2] The prevalence of CKD Stages 1, 2, 3, 4, and 5 in Indian adults was 7%, 4.3%, 4.3%, 0.8%, and 0.8%, respectively.[3] CKD patients experience multiple losses, including kidney function, family role, work role, sexual function, and time and mobility, and impact significantly on the lives of patients. Further, including medication effects, dietary constraints, fear of death, and dependency on treatment may affect the quality of life and exacerbate feelings of loss of control.[4] Diagnosis of CKD generates intense emotional distress among the patients and their families tremendously. The prevalence of psychosocial problems in chronic dialysis patients such as anxiety, depression, hostility, and suicidal tendencies is relatively common.[5,6] Patients suffering from CKD are also more prone to suffer from dementia, delirium, psychosis, anxiety, and substance abuse.[7] The most desirable treatment of CKD is hemodialysis.[8] Primary objective of hemodialysis is to restore the intracellular and extracellular fluid environment that is characteristic

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of normal kidney function, which is accomplished by the transport of solutes such as bicarbonates from the dialysate into the blood.[9] In the USA about 340 per million persons are undergoing dialysis,[10] and around 200 per million people are undergoing dialysis each year in India.[11] Hemodialysis renders the patient totally dependent on a machine and medical personnel two or three times a week. He is required to follow a strict diet and multiple daily medications. Water intake is reduced to sucking a piece of ice. The cost of the treatment is exorbitant, and it also results in the loss of working days, leading to financial strain.[11] Various physical, social, and psychological changes are encountered by the patients undergoing hemodialysis which adversely affects the quality of life (QOL) of the patient.[12]

Anxiety and depression are common among patients with chronic illnesses. Anxiety is an alarming signal, it warns of threat, external, or internal and it is probably the lifesaving more than once in a life time. Depression in dialysis patients is often the result of the combined psychological and social impairments associated with the treatment of end-stage renal disease (ESRD).[12] Major risk factors for depression are marital status, illiteracy, number of children, socioeconomic factors, gender, hypertension, and hypoalbuminemia. The most important underlying problem is the suicidal ideation, and behavior of dialysis patients is depression. To cope up with the psychological stress owing to the hemodialysis treatment, the daily routine of the patient in all aspects is highly disturbed. Effectiveness of coping strategies is determined by the needs of the individuals. For this reason, no single coping strategy works for every one or every stress. The same person may cope differently from one time to another. People in stressful situation may use a combination of problem-focused coping and emotion-focused coping strategies.[13]

Adequate primary care of patients with renal failure includes decision about the choice of the modality of treatment, down to the everyday answering of questions of patients, relatives, and staff, which requires knowledge of the major psychological stress of the illness and psychiatric complaints resulting from these stresses and their treatment. Various changes in the lifestyle and potential losses are endured by the patient on dialysis. At the earlier stages, a patient may only be constrained to rest and diet changes, but later as the disease progresses, the patient physically may not be able to cope up with his work and may take medical leave for hospitalization, which may lead to compromising his employment and further effecting the financial condition of the family. These physical and psychological stresses can lead to delirium, depression, anxiety, suicide, uncooperative behavior, sexual dysfunction, and psychosis.[14] The present study is an attempt to assess the psychiatric comorbidities in patients undergoing hemodialysis.

**MATERIALS AND METHODS**

This hospital-based, cross-sectional, analytical study was carried out at Dr. D. Y. Patil Medical College, Hospital and Research Centre during July 2015 and September 2017. The project proposal was approved by the Institute Ethics Committee.

**Sample**

Consecutive patients of CKD who were undergoing hemodialysis at the Nephrology department of the hospital and meeting the inclusion and exclusion criteria were included in the study after obtaining written informed consent.

**Inclusion criteria**

1. Patients of CKD undergoing hemodialysis
2. Willing to give consent
3. Not suffering from any serious comorbid disorder.

**Exclusion criteria**

1. Those who refuse to give consent were excluded from the study
2. Patients with intellectual disabilities were excluded from the study
3. Patients who are unable to participate in the study due to the severity of the physical disease.

**Methodology**

The patients were interviewed when they were comfortable and only after the dialysis procedure was over. First, patients were informed that their participation would be entirely voluntary and was not necessary for treatment. The objectives of this study were explained to the patients and informed consent obtained. A specially designed Pro forma was used to document background details and sociodemographic profile, clinical examination, and investigation findings. Psychiatric comorbidity was assessed by administering Schedules for Clinical Assessment in Neuropsychiatry (SCAN).[15] The psychiatric diagnoses were based on the International Classification of Disease-10 (ICD-10) Diagnostic criteria for Research (DCR).[16] The severity of symptoms was assessed in terms of duration and frequency of symptoms, degree of interference with mental function, social and occupational impairment, and other people’s reactions. Hamilton Depression Scale (HAM-D)[17] was used to assess depression and its severity. The scale was scored as per the test manual. Investigations such as hemogram, liver function test, renal function test, and serum electrolytes were done as per the nephrologists’ advice, and those results were recorded.

**Statistical analysis**

Data were collected, compiled, and tabulated. Results were statistically analyzed using the Statistical Package for the
Social Sciences version 21 (IBM, USA). Parametric data were analyzed using paired and unpaired t-test. Frequency data were analyzed using the Chi-square test.

RESULTS

The present study included 49 consecutive CKD patients undergoing dialysis. The mean age of the patients was 49.72 ± 13.2 years. Demographic and clinical characteristics of the patients are given in Table 1. The majority of the study participants, that is, 27 (55.1%) were in the age group of 41–60 years, three-fourths of the sample were males (n = 37; 75.5%) and more than half (n = 33; 67.4%) were having a monthly income between Rs. 5000 and 10,000. Results of laboratory investigations are shown in Table 2.

Mean (±standard deviation [SD]) score on HAM-D of the entire sample was 8.12 ± 5.05. Range of score was 2–26. Mean (±SD) score in those with comorbid psychiatric disorders was 12.22 ± 4.96 (range 7–26). Mean (±SD) score on HAM-D in those without psychiatric disorders was 4.703 ± 1.203 (range 2–6). Distribution of HAM-D scores in the patients is shown in Table 3.

Among 49 CKD patients in the present study, the majority of patients, that is, 27 (55.1%) did not have a comorbid psychiatric disorder while 22 (44.9) had a comorbid disorder [Table 4]. Duration of comorbid psychiatric disorder and prevalence of suicidal ideation and nonspecific symptoms are given in Table 4.

Analysis revealed that CKD patients with psychiatric comorbidity had significantly lower age, significantly shorter duration of CKD, and significantly lesser duration of dialysis as compared to that of CKD patients without psychiatric comorbidity [Table 5]. Further analysis showed that psychiatric comorbidity was significantly higher in literacy, lower income (< Rs. 10,000/month), and paying for treatment from own resources. Psychiatric comorbidity was not associated with gender, occupation, and frequency of dialysis [Table 6].

DISCUSSION

The primary aim of this study was to assess the psychiatric comorbidity in patients undergoing hemodialysis. Despite high psychiatric comorbidity in this group, these patients rarely consult psychiatrists but continue to frustrate and remain unsatisfied with physicians who manage them. A major strength of the study was that psychiatric comorbidity was assessed using the SCAN. The severity of symptoms was assessed in terms of duration and frequency of symptoms, degree of interference with mental function, social and occupational impairment, and other people’s reactions. SCAN-Present

**Table 1: Demographic characteristics of the chronic kidney disease patients (n=49) undergoing dialysis**

| Characteristic                                      | Number of cases (%) |
|-----------------------------------------------------|---------------------|
| **Age**                                             |                     |
| ≤20                                                 | 4 (8.2)             |
| 21-40                                               | 14 (28.5)           |
| 41-60                                               | 27 (55.1)           |
| >60                                                 | 4 (8.2)             |
| **Sex**                                             |                     |
| Male                                                | 37 (75.5)           |
| Female                                              | 12 (24.5)           |
| **Education**                                       |                     |
| Illiterate                                          | 20 (40.8)           |
| Primary                                             | 6 (12.2)            |
| Secondary                                           | 8 (16.3)            |
| Higher secondary                                    | 6 (12.2)            |
| Graduate                                            | 9 (18.4)            |
| **Occupation**                                      |                     |
| Homemaker                                           | 5 (10.2)            |
| Student                                             | 4 (8.2)             |
| Self-employed                                       | 1 (2)               |
| Skilled                                             | 1 (2)               |
| Unskilled                                           | 1 (2)               |
| Unemployed                                          | 37 (75.5)           |
| **Marital status**                                  |                     |
| Married                                              | 41 (83.7)           |
| Unmarried                                            | 8 (16.3)            |
| **Monthly income (Rs.)**                           |                     |
| <5000                                               | 6 (12.2)            |
| 5001-10,000                                         | 33 (67.4)           |
| 10,001-15,000                                       | 6 (12.2)            |
| 15,001-20,000                                       | 4 (8.2)             |
| **Comorbid psychiatric disorders**                  |                     |
| Funding for treatment                               | 3 (6.1)             |
| Funding for treatment                               | 46 (93.9)           |
| **Family history of psychiatric illnesses**         |                     |
| Hypertension                                         | 44 (89.8)           |
| Diabetes mellitus                                   | 17 (34.7)           |
| Thyroid disorders                                   | 1 (2)               |
| **Duration of chronic kidney disease (months)**      |                     |
| 0-5                                                 | 18 (36.7)           |
| 6-10                                                | 13 (26.6)           |
| 11-15                                               | 8 (16.3)            |
| >15                                                 | 10 (20.4)           |
| **Duration of dialysis (months)**                   |                     |
| <1                                                  | 12 (24.5)           |
| 1-3                                                 | 14 (28.6)           |
| >3                                                  | 23 (46.9)           |
| **Frequency of dialysis (per week)**                |                     |
| Two                                                 | 17 (34.7)           |
| Three                                               | 31 (63.3)           |
| **Funding for treatment**                           |                     |
| Sponsored                                           | 44 (89.8)           |
| Self                                                | 5 (10.2)            |
State Examination interview, although substantially structured, retains the features of clinical examination. It allows changes in order and wording of questions according to the way the interview is conducted. The flexibility of this approach was found helpful and useful during the interview. As the central principle of this system is not to make a diagnosis of patients, the clinicians who use it are responsible for interpreting the results according to their judgment and adequacy of interview. To make the diagnosis from collected data, ICD-10 DCR was used. Probe questions help to discover the phenomenon along with its severity. Hence, patients in whom depressive and anxiety symptoms were subthreshold can be differentiated from syndromal conditions. Thus, this tool does not over diagnose cases of depression or anxiety disorders.

Sociodemographic profile

Age-wise distribution shows that 91.8% of patients were <60 years of age and 36.7% were <40 years [Table 1]. The reason for the progression of renal failure may be the delay in detecting the renal disease, late referral, and failure to introduce preventive measures.[18] Gender-wise distribution shows that males were more likely to suffer from CKD than females. This is in agreement with the findings of an earlier Indian study.[18] The literacy rate of the study group (60%) is lower than the literacy rate of the country (74%). This could be explained by the fact that the hospital caters to the low-income rural population who have a lower literacy rate than the general population. The high levels of unemployment (75.5%) of CKD patients on hemodialysis reflect the tremendous stress and strain that CKD patients are undergoing. Majority of the study sample (83.7%) were married. This may be due to the fact that the age range of the sample was >21 years. In India, 95% of women are married by age 25, whereas the same percentage of men are married by the age of 32, whereas in Maharashtra, the mean age of marriage was found to be 18.05 years. Even in comparison with other developing countries, India has one of the lowest ages at marriage.[19]

Illness details in patients on dialysis

Analysis of duration of CKD [Table 1] shows that almost 80% of the participants in our study had been diagnosed with CKD for no later than 15 months with 36.7% is the CKD patients undergoing. Majority of the study sample (83.7%) were married. This may be due to the fact that the age range of the sample was >21 years. In India, 95% of women are married by age 25, whereas the same percentage of men are married by the age of 32, whereas in Maharashtra, the mean age of marriage was found to be 18.05 years. Even in comparison with other developing countries, India has one of the lowest ages at marriage.[19]
diagnosed <5 months ago, and only 20.4% of patients had CKD for more than 15 months. Duration of dialysis-wise distribution showed that 23 (46.9%) cases having >3-month duration of dialysis and 14 cases (28.6%) having 1–3 months while 12 cases (24.5%) having <1-month duration of dialysis. Since most patients in our study group have had a recent-onset CKD, a majority of the patients (53.1%) are undergoing dialysis for <3 months. Comorbidity-wise Table 1 distribution showed that around 90% of the patients in the study group had hypertension and 34.7% have diabetes mellitus. Since diabetes and hypertension are the major contributing factor of renal failure that has to be managed properly in its initial stage itself. The lifelong treatment of renal failure along with diabetes and hypertension significantly increases the burden on patients and decreases the outcome also.[20]

Frequency of dialysis per week-wise Table 1 distribution showed that 65.3% of the patients undergo dialysis three times per week, this is because most of the cases have started dialysis fairly recently and early; hence, the frequency of dialysis is more. Treatment expenses-wise Table 1 distribution showed that 44 (89.8%) cases showing treatment expenses among sponsored while five cases (10.2%) have self-treatment expenses. Since the majority of the patients visiting the hospital belong to the low socioeconomic status, the treatment of approximately 90% of patients in our study group is sponsored by the government.

Laboratory investigations Table 2 found that all patients enrolled in the study group had some degree of anemia. A recent review of renal anemia concluded that anemia in CKD is due to two mechanisms; (a) reduced production of erythropoietin in the kidney and (b) due to shortened red cell survival.[20]

HAM-D-wise Table 3 distribution showed that around 40% of the cases in the study group were diagnosed with some degree of depression. This finding was similar to earlier studies that showed 30% to 40% prevalence of depression in CKD patients undergoing dialysis.[17]
Suicidal ideation [Table 4] among patients with psychiatric comorbidities shows that one in three patients with psychiatric illness had suicidal ideations. These findings were in accordance to a meta-analytic study,\(^ {23}\) which reported that suicidal ideation was a common finding among those patients on dialysis with psychiatric morbidities and that depression could be a predisposing factor for the suicidal ideation.

Psychiatric comorbidity-wise distribution [Table 4] showed that 45% of patients undergoing hemodialysis had psychiatric comorbidity, most commonly a depressive disorder (29%). Previous studies reported that the prevalence of psychiatric comorbidity to be 30%–40%, the most common of which was a depressive episode.\(^ {8}\)

The duration of psychiatric illness [Table 1] for most of the patients (69%) was of 3 months or less. The majority (54%) of the patients in our study group were started on dialysis relatively recently (<3 months). It has been suggested that the psychological, social, and biological impact of starting dialysis could be a stressor which precipitated psychiatric illnesses.\(^ {23}\) This could explain the temporal relationship between the start of dialysis and onset of psychiatric illness.

Nonspecific symptom-wise [Table 4] distribution showed that localized tension pain, irritability, and worry are the most common of the nonspecific symptoms. Depression and adjustment represent the majority (41%) of the psychiatric illness in these patients; these disorders are largely associated with the nonspecific symptoms mentioned above. Considering this, these findings are not surprising. Psychiatric illness-wise [Table 4] distribution showed that around 45% of the cases in the study group have been diagnosed with a psychiatric illness, which is in agreement with earlier studies. A recent Indian study conducted on 130 CKD patients, and the prevalence of psychiatric illness in CKD patients undergoing dialysis was around 40%.\(^ {8}\) Another study conducted on 69 patients with ESRD found the prevalence of psychiatric illness to be 46%.\(^ {23}\) The finding of these studies is similar to our study.

In the study group, two-thirds of the participants were males; however, when an association between sex and psychiatric illness [Table 6] was analyzed, the percentage of males and females among the psychiatric patients and the patient without psychiatric illness was found to be similar. The \(P > 0.05\) making it does not statistically significant. Another study done in India which also looked for an association between sex and psychiatric illness among those on dialysis had a similar finding with no statistical difference.\(^ {9}\)

Association between education and psychiatric illness [Table 6] shows that approximately 61% of our study group have reported to have some level of formal education. It was seen that these people have a higher chance of psychiatric comorbidity as compared to those uneducated. This could be due to the fact that educated people understand the consequences and long-term morbidity of their illness better than the uneducated. Perhaps, another factor that could be at play is that educated hold higher income jobs and are the breadwinners of the family, and this illness has affected their livelihood more than uneducated people.

Association between occupation and psychiatric illness [Table 6] shows that there is no significant difference between occupation and psychiatric illness. This was in accordance to another study, in which, it was found that younger patients, despite undergoing hemodialysis therapy, maintain their occupational activities, resulting in higher levels of physical activity in relation to older people.\(^ {23}\)

Association between monthly income and psychiatric illness shows that the chances of a psychiatric illness in people with income <10,000 rupees are less as compared to patients with income >10,000. This could be explained perhaps by the fact that majority of the people of lower income had their treatment sponsored by the government and thus were less financially stressed and produced a decrease in the percentage of psychiatric illness in that group [Table 6].

Comparison of dialysis in relation to psychiatric illness

More than 1/3 of the patients who had a psychiatric diagnosis were suffering from adjustment disorder, [Table 4] the stressor being the shock of being diagnosed with CKD and the initial pain of a dialysis procedure. As the duration of CKD and dialysis increases, the patients were able to cope up with the stressor with the help of family support and intervention by the hospital. This explains the decrease in the percentage of psychiatric illness as the duration of CKD and dialysis increases.
Analyzing depression in peritoneal dialysis was found that there is no association between the frequency of dialysis and presence of depression.[26] Similar to the above findings, when analyzing the association between the frequency of dialysis and psychiatric illness, [Table 6] our study shows that the frequency of dialysis has no effect on the presence or absence of psychiatric illness.

Trautmann et al. concluded that the stress of financial burden acts as a precipitating factor for psychiatric illness.[27] Our study findings of an association between treatment expenses and psychiatric disorder also lead to a similar conclusion [Table 6].

**Limitations**

1. Due to time constraints, the sample size was small
2. Being a hospital-based study, selection bias could have inadvertently crept in.

**CONCLUSION**

Psychiatric comorbidity was significantly higher in CKD patients undergoing hemodialysis. Psychiatric comorbidity was more common in males in the age group of 41–60 years. The most common psychiatric comorbidity in CKD patients undergoing hemodialysis was depression (26%), followed by adjustment disorder (12.2%), generalized anxiety disorder (2%), mixed anxiety and depression (2%), and mental and behavioral disorders due to harmful use of alcohol (2%). Patients undergoing hemodialysis is more likely to have mood disorder than other psychiatric disorders. In addition, there was a high prevalence of nonspecific symptoms such as worry (79.6%), localized tension pain (71.4%), and irritability (53.1%). Patients with recent-onset dialysis are significantly more prone to develop psychiatric disorders.

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**Conflicts of interest**

There are no conflicts of interest.

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