

# Association between Psychiatric Illness and Social Support, Cognitive Functioning, Treatment Adherence and Functional ability in Chronic Kidney Disease Patients

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## ABSTRACT

**Introduction:** Chronic Kidney Disease (CKD) is emerging as an important chronic disease globally. In India, it is estimated that prevalence of CKD is around 15 -20%. Patients with CKD are prone to develop psychiatric illness like depression, anxiety, insomnia and even psychosis. Multiple factors contribute to the risk of psychiatric morbidity in CKD. Psychiatric morbidity in CKD is associated with poor adherence and outcome. Study aimed to determine the association of psychiatric morbidity in CKD with factors like social support, functional ability, cognitive functioning and its impact on treatment adherence in chronic kidney disease.

**Material and methods:** Cross sectional study, conducted in department of nephrology, Kilpauk Medical College for 6 months from February 2017 to August 2017. Consenting patients in the age group of 18 – 60 years, diagnosed to have CKD by consultant nephrologist and on various treatment modalities (conservative treatment, hemodialysis, renal transplantation) were included in this study. Patients diagnosed to have mental illness prior to the onset of CKD were excluded.

**Results:** A total of 110 patients consented to participate in the study. Of these, 36.4% (n=40) were in conservative treatment, 31.8% (n= 35) were in hemodialysis, 31.8% (n=35) were post renal transplant patients.

**Conclusion:** Treatment adherence, social support system and functional ability were better for patients on post renal transplantation than either conservative treatment or hemodialysis.

**Keywords:** Psychiatric Illness, Chronic Kidney Disease, Adherence, Karnofsky, Social Support.

In previous studies, the mental disorders frequently observed in CKD patients are affective disorders, particularly depression, organic brain diseases (delirium and dementia), substance use disorders, anxiety etc. Depression is an independent factor for non-adherence in patients on maintenance dialysis and suicide is highly linked with depressed state. In previous studies, prevalence of psychiatric illness has been found to be about 32% - 40% in CKD patients.<sup>3</sup> Psychiatric comorbidity in CKD is an important factor in determining the treatment outcome.<sup>4</sup> Thus, it is important to evaluate the prevalence and severity of psychiatric disorders in people with CKD and to study the factors like social support, functional ability, cognitive functioning and their impact on treatment adherence in relation to psychiatric illness.

## MATERIAL AND METHODS

Cross sectional study, conducted in Department of Nephrology, Kilpauk Medical College for 6 months from February 2017 to August 2017. Consecutive patients in the age group of 18 – 60 years, diagnosed to have CKD by a consultant Nephrologist and on any one of the treatment modalities (conservative treatment, hemodialysis, renal transplantation) were included in this study. Patients diagnosed to have mental illness prior to the onset of CKD were excluded. Informed consent obtained from those willing to participate. Ethical approval for the study was obtained from the Ethics committee, Government Kilpauk Medical College, Chennai prior to the start of the study.

Symptom Check List - 90 was used to screen for psychiatric disorders. In those patients who screened positive for any psychiatric illness, detailed psychiatric evaluation was done as per ICD 10 criteria to arrive at psychiatric diagnosis. Hamilton Depression Rating Scale (HAM-D) and Hamilton Anxiety Rating Scale (HAM-A) were used for assessing the

## INTRODUCTION

Chronic Kidney Disease (CKD) is emerging to be an important chronic disease globally. 10% of the population worldwide is affected by CKD. According to 2010 Global Burden of Disease study, CKD was ranked 27<sup>th</sup> in the list of causes of total number of deaths worldwide in 1990, but rose to 18<sup>th</sup> in 2010. Over 2 million people worldwide currently receive treatment with dialysis or kidney transplant.<sup>1</sup> In India, it is estimated that prevalence of CKD is around 15 -20%. Prevalence of CKD stages 1,2,3,4 and 5 was 7%, 4.3%, 4.3%, 0.8% and 0.8% respectively.<sup>2</sup> Patients with chronic medical conditions often have to adjust their aspirations, lifestyle, and employment. Many grieve about their predicament before adjusting to it. But others have protracted distress and may develop psychiatric disorders, most commonly depression or anxiety.

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severity of depressive and anxiety disorders respectively.<sup>5,6</sup> Severity of Alcohol Dependence Questionnaire (SADQ) score was used to assess the severity of alcohol dependence. Montreal Cognitive Assessment (MoCA) was used to assess Cognition.<sup>7</sup> Karnofsky's performance Scale was used to assess functional ability.<sup>8</sup> The multidimensional scale of perceived social support was used to measure social support.<sup>9</sup> Medication adherence was measured by Medication Adherence Rating Scale (MARS).<sup>10</sup> Patients were grouped as low, medium or high on adherence based on the score in the MARS. Appropriate statistical measures were used to determine association between variables.

### STATISTICAL ANALYSIS

Statistical analysis was done using computer software SPSS, to assess the prevalence of psychiatric illness in CKD patients, and to assess the type and severity of psychiatric

illness and their proportion in relation to treatments (conservative, hemodialysis, post renal transplantation), and to study the association between psychiatric illness and the factors like support systems, patients functional level, treatment adherence. P value was taken to be significant if it was <0.05.

### RESULTS

A total of 118 patients were approached for our study. Of these, 5 patients did not give consent to participate in the study and 3 were dyspneic, and hence could not be included in the study. The remaining 110 patients consented to participate in the study and were tested. Of these 110 patients, 36.4% (n=40) were in conservative treatment, 31.8% (n= 35) were in hemodialysis, 31.8% (n=35) were post renal transplant patients. Presence of psychiatric illnesses were high in conservative treatment (52.5%) than

Treatment	Psychiatric Illness	Multidimensional Scale of Perceived Social Support			P value	
		Low	Medium	High		
Conservative Treatment	Present	8	9	4	9.969	0.007
	Absent	1	6	12		
Hemodialysis	Present	4	5	6	6.076	0.048
	Absent	0	10	10		
Renal Transplantation	Present	0	8	3	12.696	0.001
	Absent	0	3	21		

**Table-1:** Association between Psychiatric Illness and Perceived Social Support in CKD

Treatment	Psychiatric Illness	Karnofsky's Performance Scale			P Value	
		A	B	C		
Conservative Treatment	Present	15	6	0	0.301	0.583
	Absent	15	4	0		
Hemodialysis	Present	5	4	6	6.121	0.047
	Absent	12	8	0		
Renal Transplantation	Present	11	0	0	NA	NA
	Absent	24	0	0		

**Table-2:** Association between Psychiatric Illness and Functional Ability in CKD

Treatment	Psychiatric Illness	Montreal Cognitive Assessment Scale		Chi Square Test	P Value
		Score ≥ 26	Score < 26		
Conservative Treatment	Present	2	19	1.905	0.168
	Absent	0	19		
Hemodialysis	Present	7	8	1.033	0.114
	Absent	11	9		
Renal Transplantation	Present	7	4	2.076	0.150
	Absent	9	15		

**Table-3:** Association between Psychiatric Illness and Cognition in CKD

Treatment	Psychiatric Illness	Medication Adherence Rating Scale (MARS)			Chi Square Test	P Value
		High	Medium	Low		
Conservative Treatment	Present	9	8	4	4.406	0.110
	Absent	12	7	0		
Hemodialysis	Present	7	4	4	6.027	0.049
	Absent	13	7	0		
Renal Transplantation	Present	8	3	0	0.600	0.742
	Absent	18	5	1		

**Table-4:** Association between Psychiatric Illness and Adherence in CKD

in patients undergoing hemodialysis (42.9%) than in patients in post renal transplantation (31.4%). Overall presence of psychiatric illness was 42.7% in the sample.

**Psychiatric Illness and Perceived Social Support in CKD:** In the analysis of perceived social support and psychiatric illness, patients with low perceived support had high prevalence of psychiatric illness in conservative treatment (chi square = 9.969;  $P = 0.007$ ) and hemodialysis treatment group (chi square = 6.076;  $P = 0.048$ ). In post renal transplantation group, majority of the patients had high support system and had a lower prevalence of psychiatric illness (chi square = 12.696;  $P = 0.000$ ) (Table 1). Thus, in each of the CKD sub groups, social support is protective against mental illness.

**Psychiatric illness and functional ability of patients with CKD:** In the analysis of functional ability using Karnofsky's performance scale, patients unable to care for self and requiring an equivalent of institutional or hospital care had statistically significant association with presence of psychiatric illness in hemodialysis treatment patient group. (chi square = 6.121;  $P = 0.047$ ). No statistically significant association was observed between functional ability and presence of psychiatric illness in conservative or renal transplanted patients (Table 2)

**Psychiatric illness and Cognitive Functioning in CKD:** In the analysis of cognitive functioning measured using Montreal Cognitive Assessment (MoCA) and presence of any psychiatric illness, no statistically significant association was observed in any of the treatment groups (Table 3)

**Psychiatric Morbidity and Adherence in CKD:** In the analysis of treatment adherence using Medication Adherence Rating Scale (MARS), presence of any psychiatric illness was associated with low treatment adherence in both conservative and hemodialysis group, but it was statistically significant in hemodialysis group. The post-transplant group was observed to be uniformly high on adherence and no statistical differences were noted in this group (Table 4)

## DISCUSSION

Of the 110 chronic kidney disease patients studied, 36.4% were in conservative treatment, 31.8% were in hemodialysis, 31.8% were in post renal transplantation treatment. Thus, it could be considered that the groups were evenly distributed. 42.7% of patients had some psychiatric illness indicating a high overall prevalence. There were differences in prevalence in different treatment groups similar to Kalman et al., 1983.<sup>11</sup> The lowest prevalence was noted in the post-transplant group (31.4 %) and the highest in the conservative treatment group (52.5) though the difference was not significant. The association between transplant and change in psychiatric morbidity has already been noted in previous studies.<sup>12</sup> Perceived social support was associated significantly with mental health. In all three groups of CKD patients, individuals with psychiatric morbidity experienced lower social support. The post-transplant group had the most social support. These

findings are in broad agreement with various studies in the past by Chen et al, 2010 and Edege et al., 2007.<sup>13,14</sup> Good social support is related with better survival outcome by authors like Kimmel et al., 1998.<sup>15</sup>

Functional ability is often associated with mental fitness. Functional ability can be a cause or a consequence of mental health. In our study we observed an association between poor functional ability and psychiatric morbidity in the hemodialysis group. This was similar to findings from other studies.<sup>16</sup> Similar associations were not noted in the conservative treatment and post-transplant group, perhaps due to the small number of participants.

Cognition is reported to be impaired in patients with CKD.<sup>17</sup> Dialysis, electrolyte imbalance all contribute to cognitive impairment.<sup>18</sup> No specific association between psychiatric morbidity and cognitive impairment were detected in any of the groups. This is unlike to that reported by Pawar et al., in 2006.<sup>19</sup>

Adherence is significantly associated with outcome. Mental illness is known to impair insight, motivation and adherence. This association is well documented in various studies (Cukor et al., 2009; DiMatteo et al., 2000 and Raynor et al., 2006).<sup>20-22</sup>

## Limitations

Our study was a cross sectional observation study. An analytical study design may provide more information regarding factors associated with presence of psychiatric illnesses and treatment adherence among various treatment groups.

## CONCLUSION

In this study, we determined that in CKD patients on hemodialysis psychiatric morbidity resulted in significantly poorer adherence. This is much in line with past evidence. In the other two sub groups however, no significant association was noted. This may be due to a skewed sample with poor compliance in conservative group and very good adherence in post-transplant group.

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