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A Comparative Study on Quality of life in Hemodialysis versus Peritoneal Dialysis Patients : a Single Center Study from North East India

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Abstract

Background and Objectives: Quality of Life (QoL) in patients with chronic kidney disease (CKD) is an important outcome for dialysis modality selection for both physicians and patients. At Gauhati Medical College and Hospital, we compared the quality of life between hemodialysis and peritoneal dialysis patients.

Study Design: A Cross-sectional study on hemodialysis and peritoneal dialysis patients.

Patients and Methods: The study included three hundred dialysis patients, one hundred and fifty in each dialysis modality category, from May 2017 to August 2020. We used a cross-sectional design and recorded the data using the Kidney Disease Quality of Life (KDQoL SF) questionnaire.

Results: The patients had identical sociodemographic features in both classes (age, marital status, educational level, etiology of renal failure, etc). The mean age was 48.5 ± 12.8 years in the HD group and 50.0 ± 12.5 years in the PD group. Males accounted for 52% and 45%, respectively. Among peritoneal dialysis, QoL mean scores were significantly higher in all domains except for the physical function domain which appeared to be higher in hemodialyzed patients although it was not statistically significant (p value 0.298).

Conclusion: Patients undergoing peritoneal dialysis have higher QoL compared to patients undergoing hemodialysis, validating the results of studies from other countries.

Keywords: Chronic Kidney Disease, Comparison, Hemodialysis, Peritoneal dialysis, Quality of life, KDQoL SF questionnaire

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1 | INTRODUCTION

The high prevalence and incidence of chronic kidney disease (CKD) have made it a global health issue. In addition to the weak disease-related prognosis, the cost of public health services is greatly increased by CKD.¹ The estimated prevalence of CKD varies from 1% to 13% in different regions, and recently, analysis of the International Society of Nephrology's Kidney Disease Data Center Study reported a prevalence of 14.3%.² By 2030, India is projected to have the world's largest population of diabetes patients which is the major underlying cause for CKD.³ Severe or untreated CKD may impair one's ability to perform day to day activities. Primary kidney disorders or systemic problems such as systemic hypertension may cause CKD.⁴ Other aetiologies may be involved, such as chronic glomerulonephritis (secondary to IgA nephropathy, lupus erythematosus and systemic vasculitis), urinary tract obstruction, inherited renal disease (polycystic kidney disease), medications, toxic and occupational agents, infections, nephrectomy, and renovascular disorders.⁵

CKD presents a decrease in glomerular filtration rate (GFR) $< 60 \text{ mL/min/1.73 m}^2$ for three months or more.^{1,2} Renal replacement therapy (RRT), the preferred treatment for patients with advanced (stage 5) CKD, is classified into three types: hemodialysis (HD), peritoneal dialysis (PD), and kidney transplantation.^{6,7} Jassal et al. interviewed 132 directors of renal care units in Great Britain and stated that the choice of treatment was influenced by the will of the patient and the quality of life, morbidity and mortality associated with the prescribed mode of RRT. RRT information is typically provided to patients with stage 4 disease⁸ and applied as a therapy when they pass to stage 5 CKD.^{10,11}

With the aid of an arteriovenous fistula and an artificial filter, HD involves the extraction solutes and fluids. In a strict regimen that inhibits the mobility of the patients, patients typically undergo HD three times a week, in sessions lasting three to four hours.^{9,11} PD uses the peritoneum as an exchange membrane and provides the option of treating patients at home. Rejection of the donated organ is the principal complication of kidney transplantation accounting for a

substantial number of patients who will eventually require RRT.¹²

The term Quality of Life comprehends a wide range of indicators covering overall satisfaction with life in areas such as health, housing conditions, employment, safety, education, and leisure. In terms of health, the physical, social, and emotional impacts introduced by a disease and its treatment are considered.¹³ The quality of life of patients with CKD on dialysis was assessed through the *Kidney Disease Quality of Life* (KDQOL) scale developed by the Kidney Disease Quality of Life Working Group.^{1,14} This scale includes variables such as physical health, rest, energy, cognitive performance, sexual satisfaction, eating patterns, social life, and communication, pain presence/absence, family relationships, job, leisure, and emotional status.^{5,15} These criteria were correlated with the form of care given, among other variables. It was found that the daily lives of HD and PD patients were affected differently.¹⁶ While different modes of dialysis are similar in terms of patient recovery and mortality, the quality of life offered by each mode still needs further study.

Compared to healthy people, both HD and PD patients have reduced QoL scores. With the understanding of the importance of physical health deterioration as opposed to mental health, QoL decreases over time. Many patients, however, continue to feel helpless, nervous, and concerned about their financial problems, loss of sexual function, family burden, and loss of independence.¹⁷ Previous studies have shown that the QoL of patients with PD was higher than that of patients with HD.¹⁸

This study was aimed to assess the consistency of these findings in our

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2 | METHOD

This study protocol was approved by the Gauhati Medical College & Hospital Ethics Committee. Enrolled subjects were informed of the goals of the study and voluntarily signed an informed consent form.

The study included 300 diagnosed cases of CKD patients more than 18 years old seen between May 2017 and August 2020 at the Department of Nephrology, Gauhati Medical College and Hospital. Patients who had cognitive impairment, a focal neurological deficit in the form of paresis/paralysis and psychiatric illness that prevented understanding and responding to the QoL questionnaires were excluded from the study.

As suggested and used by many previous studies, a cross-sectional approach was used to promote this QoL study.¹⁷⁻¹⁹ The questionnaire had two sections; a section on basic demographic details, key caregiver and dialysis length, and a section on the Quality of Life Scale of Kidney Disease (KDQOL-SF-1.3).¹⁹ The KDQoL scale is disease-oriented and focuses on specific health-related problems, such as the impact of kidney disease on everyday life, the stress of kidney disease, work status, cognitive function, and social interaction, sexual function, social support, support from dialysis workers, and patient satisfaction.

Quality of life data was analyzed and entered into Microsoft Excel using the KDQOL-SF Version 1.3. A Microsoft Excel spreadsheet was entered with data on patient identity and socioeconomic status. Using the software package SPSS v.21.0.0, statistical analysis was carried out. Depending on the data distribution pattern, comparisons between the two groups were carried out using the Student t-test for independent variables or the Mann-Whitney U test. To measure distribution homogeneity, the chi-square test was used. Differences with a p-value <0.05 were considered statistically significant.

3 | RESULTS

Among the 300 patients with CKD who participated in our study, 150 patients were on regular

maintenance hemodialysis, and 150 patients were on regular peritoneal dialysis (Table 1). The maximum proportion of patients in both groups of subjects were in the age group of 40 to 60 years. The mean age in HD group was 48.5 ± 12.8 years and in PD was 50.0 ± 12.5 years.

In the kidney disease-specific dimensions of the KDQOL-SF 1.3 (Table 2), the peritoneal dialysis patients had better results compared to hemodialysis patients in the following scales:

Effects of kidney disease (58.38 ± 18.76 vs 72.83 ± 17.89 , $p=0.019$); Burden of kidney disease (23.24 ± 16.48 vs 57.65 ± 27.31 , $p=0.015$); Work status (17.82 ± 9.43 vs 49.00 ± 44.72 , $p=0.001$); Overall Health (76.67 ± 19.69 vs 46.49 ± 22.51 ; $p = 0.018$) and Patient Satisfaction (71.02 ± 20.43 vs 82.72 ± 20.67 , $p=0.001$). QoL mean scores were also higher among peritoneal dialysis in all the parameters of QoL score, with the exception of the score of physical functioning, which was higher in the hemodialysis patients 52.1 ± 32 compared to peritoneal dialysis patients 43.7 ± 23.6 , although the difference was not statistically significant ($P=0.298$).

In the remaining scales, values were almost similar for both groups.

In our study, with the exception of the physical QoL score, QoL mean scores were higher in all domains and total QoL among PD patients compared to HD patients. Our findings are consistent with other studies that showed substantial advantages for PD in some QoL domains.¹⁹ Other studies also showed that patient survival was higher, and QoL was better for PD than for HD patients.²⁰ However, among patients receiving both dialysis modalities, patient satisfaction with dialysis treatment is similar.²⁰

Social functioning and vitality of dialyzed patients decrease over time, particularly from 3 to 18 months after the onset of treatment.²¹ Compared to our PD patients, the longer the period after initiation of hemodialysis among our patients eventually compromised functioning for their daily activities; hence a more compromised QoL than PD patients.²³ Patients undergoing PD are more free and understandably capable of doing so. PD patients may continue their jobs, too.²³ This may be clarified by many conditions that we have to take into account, such as

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TABLE 1: Age and gender distribution among hemodialysis and peritoneal dialysis patients

	Dialysis modality		
	Hemodialysis (n=150)	Peritoneal dialysis (n=150)	
Age (years)			
<40	44(29%)	35(23%)	
40-60	66(44%)	71(47%)	0.32
60+	40(27%)	44(30%)	
Mean (SD)	48.5 ± 12.8	50.0 ± 12.5	0.07
Gender			
Male	78(52%)	68(45%)	0.16
Female	72(48%)	82(55%)	

TABLE 2: Quality of life scores of hemodialysis and peritoneal dialysis patients

	Haemodialysis	Peritoneal Dialysis	
Symptom/problem list	72.83 ± 18.56	76.48 ± 19.16	0.371
Effects of kidney disease	58.38 ± 18.76	72.83 ± 17.89	0.015
Burden of kidney disease	23.24 ± 16.48	57.65 ± 27.31	0.001
Work status	17.82 ± 9.43	49.00 ± 44.72	0.001
Cognitive function	65.82 ± 22.89	81.56 ± 17.75	0.082
Quality of social interaction	78.26 ± 17.71	80.03 ± 14.10	0.888
Sexual function	57.37 ± 45.16	86.50 ± 14.43	0.271
Sleep	57.57 ± 17.60	63.50 ± 29.02	0.683
Social support	77.07 ± 22.36	83.87 ± 16.19	0.153
Dialysis staff encouragement	80.31 ± 14.45	89.28 ± 12.35	0.059
Overall health	45.49 ± 22.51	73.67 ± 19.69	0.018
Patient satisfaction	71.02 ± 20.43	82.72 ± 20.67	0.001
General health	43.8 ± 17.1	53.45 ± 9.8	0.001
Physical	52.1 ± 32	43.7 ± 23.6	0.298
Emotional	51.5 ± 14.8	60.9 ± 13.5	<.001
Social	52.9 ± 18.1	63.0 ± 17.5	<.001
Illness impact	43.5 ± 14.2	64.9 ± 9.5	<.001
Financial and medical satisfaction	44.9 ± 12.2	65.4 ± 13.0	<.001

the financial condition of the family, the number of children, sociocultural influences and job laws that offer patients a maximum paid day off on dialysis day.

4 | CONCLUSION

Overall, in all domains except the physical domain, QoL is better for PD than HD patients. Patients on PD spent more time on a better quality of life and were generally happier than patients on HD.

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