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Research Article

ASSESSMENT OF QUALITY OF LIFE IN CHRONIC KIDNEY DISEASE PATIENTS USING THE KIDNEY DISEASE QUALITY OF LIFE-SHORT FORM™ QUESTIONNAIRE IN INDIAN POPULATION: A COMMUNITY BASED STUDY

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ABSTRACT

Objective: The objective of this study is to measure the quality of life (QOL) among the chronic kidney disease patients undergoing hemodialysis and peritoneal dialysis.

Methods: The present study is observational and prospective, multicentered in an ambulatory setup located in Chennai, South India during November and December 2013. A total 50 patients were observed by using kidney disease QOL short form™ (KDQOL-SF™) questionnaire.

Results: A total of 50 end-stage renal disease (ESRD) subjects were enrolled in the present study, 56% and 44% subjects were on hemodialysis and peritoneal dialysis, respectively. In the present study, 58% were of male subjects and 76% of them were married. About 78% of subjects had diabetes mellitus as single comorbid. The present study assessed all the four domains of KDQOL in the study subjects. Physical health (PH) was significantly affected among all the four domains of the KDQOL and an average score was found to be 25.45±11.85 ($p<0.0015$). The average value of 71.93±12.35% ($p<0.029$) subjects were having satisfaction with dialysis care, which is lower than the recommended value of <65%.

Conclusion: The present study revealed that ESRD patients have a poor QOL and most the affected domain is PH, hence measuring and monitoring these aspects of QOL could lead to a more patient-centered care and improve the health and well-being among patients with chronic renal failure.

Keywords: Chronic kidney disease, Health related quality of life, Kidney disease quality of life-short form™, Hemodialysis, Urea reduction ratio.

INTRODUCTION

Chronic kidney disease (CKD) is an emerging disease caused by diabetes, hypertension, and other disease. Diabetes and hypertension are responsible for nearly one third and one-fifth of CKD, respectively [1]. Apart from diabetes, hypertension, obesity, smoking and aging are also causes of CKD. CKD is associated with increased incidences of cardiovascular mortality and loss of disability adjusted quality of life (QOL) years [2].

In India, majority of the CKD patients belong to the younger population when compared with other countries [3]. According to World Health Organization global burden of disease project, disease of the kidney and urinary tract contribute to approximately 850,000 deaths every year of which CKD is the 12th leading cause of death and 17th leading cause of disability in the world [4]. Approximate total burden of CKD is 800 per million population. It has been reported that diabetes mellitus as the cause of CKD was found in 31.2 to 41.0% of patients in India [5].

Overuse of non-steroidal anti-inflammatory medicines is another factor that induces kidney inflammation that can lead to kidney failure. Several types of kidney disease are grouped together under this category, including autoimmune diseases, infection-related diseases, and sclerotic diseases. As the name indicates, glomerular diseases attack the tiny blood vessels or glomeruli, within the kidney [6]. CKD causes long-term damage to the kidneys and may or may not have symptoms. In some cases, CKD will progress over time to kidney failure. If the kidneys do fail, dialysis or a kidney transplant is needed to support life as renal replacement therapy (RRT) [7].

Three methods (urea kinetic modeling, Kt/V and urea reduction ratio [URR]) are suggested to measure the adequacy of hemodialysis NKF-kidney disease outcomes quality initiative (K/DOQI) among which URR is considered as most appropriate for assessing hemodialysis performance. It is the simplest to execute and widely used to express the dialysis dose [8]. The adequacy of dialysis in hemodialysis patients was assessed by URR of which <65% indicates poor adequacy of dialysis [9].

Objectives

The main purpose of this study is to find out the QOL among the CKD patients who how have undergone hemodialysis and peritoneal dialysis with respect to their physical and psychosocial parameters and impact of age, gender, income and educational status, duration of co-morbid conditions and duration of dialysis period.

METHODS

Study setting

Study site: We have recruited the end stage renal disease (ESRD) patients who had scheduled appointments at two tertiary care clinics in ambulatory setup located at Chennai, South India. The study procedures were approved prior to study enrollment from independent ethical committee.

Study design: Observational and prospective study.
Study period: 2 months.
Study time: November and December 2013.

Study criteria

Inclusion

Diagnosed cases of ESRD based on the guidelines given by K/DOQI, 2002 (as per the guidelines given by NKF); above 35 years and <70 years of age, both genders i.e. male and female.

Exclusion

Admitted in the ward for any acute medical illness, had any form of neurological illness which causes hindrance in their day to day activities and mental health (MH) problem and who are not willing to participate and not providing informed consent form.

Study instrument: Proforma, kidney disease QOL short form™ (KDQOL-SF™) Version 1.3 questionnaire [10].

Study population: 50 ESRD patients.

Proforma consists of detailed histories of personal, social and medication history, laboratory investigations and findings relating to the disease condition and clinical parameters of the patients. Thus, a proforma containing a total of 24 questions was used. The following dialysis parameters were studied for patients who were on maintenance hemodialysis:

- Durations of dialysis
- Type of dialysis
- Serum albumin level
- Hemoglobin (Hb) concentration
- Hematocrit level and
- Adequacy of dialysis.

The URR as expressed in % was calculated by [11];

$$URR = 100 \times (1-[C_t/C_0])$$

in which C_t is the post-dialysis blood urea nitrogen (BUN) and C_0 is the pre-dialysis BUN.

KDQOL-SF™ is a multidimensional, reliable and validated questionnaire intended for dialysis patients. It has 43 domains targeted for ESRD (43 items) and has as its generic core the 36 domain of the short form health survey (SF-36). It assesses the following parameters:

ESRD targeted domains

Medical outcomes study short form 36 targeted domains: These domains are divided into 4 and each domain is further subdivided as follows:

1. Physical health (PH): (a) Physical functioning, (b) work status, (c) role limitation due to physical function, (d) general health, (e) pain, (f) energy/fatigue and (g) social function
2. MH: (a) Emotional well-being, (b) quality of social interaction, (c) burden of kidney disease, (d) social support and (e) role limitation due to emotional function
3. Kidney disease problems: (a) Cognitive function, (b) symptoms/problems, (c) effects of kidney disease, (d) sexual function and (e) sleep
4. Patient satisfaction (PS): (a) PS and (b) staff encouragement.

The survey instruments were translated into the local language (Tamil) as per the guidelines provided by the KDQOL working group. Informed consent was obtained from the patient before starting of the study. The study subjects were requested to answer by themselves, and the interviewer helped to fill the survey instruments. Patients were asked to recall their experience of the past 4 weeks.

Statistical analysis

The data were recorded and calculated for their mean values of various parameters and the average values of the four domains of the KDQOL by using SigmaStat Demo version (STATCON, Germany). One-way analysis of variance method was used to compare the average values in the three groups. "F" and "P" values were analyzed for the appropriate data to find out the significance. Pearson's correlation coefficient of the different variables with the four domains of the KDQOL was also assessed.

RESULTS

The mean age of the patients observed was 55.75±10.25, more number of patients affected was in the age group of 51-60 and they are of about 28 subjects (56%), followed by 11 subjects (22%) in the age group of 41-50, 7 subjects (14%) were in 60 to >70 age group and the least number of patients affected were 4 (8%) subjects in the age group of >35-40. The present study shows that the number of male (58%) was more than the female (42%) subjects, and 76% of them were married. In our study, the educational status was observed as 21 (42%) subjects were of schooling level and 29 (58%) subjects were of degree holders. The present study shows that about 24 (48%) subjects were under the treatment from <5 years, followed by 16 (32%) subjects from 6 to 10 years and 10 (20%) subject from >20 years. Fifty ESRD subjects were enrolled in the present study out of which 28 (56%) subjects were on regular hemodialysis and 22 (44%) subjects were on regular peritoneal dialysis and all 50 subjects were on drugs. Data were represented in Table 1.

In the present study, the following comorbidities were observed in the enrolled subjects; diabetes mellitus, chronic glomerulonephritis, cardiac and pulmonary diseases, rheumatologic arthritis and peptic ulcer disease. Diabetes mellitus was found to be the most frequent cause of ESRD, 39 (78%) followed by chronic glomerulonephritis 10 (20%) and few of them were having multiple comorbid conditions also. The study subjects had altered laboratory values raging from moderate to severe, with an average level of hemoglobulin (7.92±2.35), hematocrit

Table 1: Demographic characteristics of the ESRD patients in the three groups

Parameters	N (%)	p value Chi-square test
Age (years)	55.75±10.25	
>35-40	4 (8.00)	<0.05
41-50	11 (22.00)	
51-60	28 (56.00)	
60 to>70	7 (14.00)	
Gender		
Male	29 (58.00)	<0.05
Female	21 (42.00)	
Marital status		
Married	38 (76.00)	<0.05
Divorced	9 (18.00)	
Single	3 (6.00)	
Educational status		
Schooling	21 (42.00)	<0.05
Degree holders	29 (58.00)	
Duration of treatment (years)		
<5	24 (48.00)	<0.05
6-10	16 (32.00)	
>20	10 (20.00)	
Type of dialysis		
Hemodialysis	28 (56.00)	<0.05
Peritoneal	22 (44.00)	
Income (Rs.)		
<10,000	32 (64.00)	<0.05
10,001-25,000	10 (20.00)	
>25,000	8 (16.00)	
Health insurance		
Yes	13 (26.00)	<0.001
No	37 (74.00)	
Comorbid conditions		
Diabetes mellitus	39 (78.00)	<0.05
Chronic glomerulonephritis	10 (20.00)	
Cardiac and pulmonary diseases	12 (24.00)	
Rheumatologic	8 (16.00)	
Peptic ulcer disease	5 (10.00)	
Laboratory data		
Hb	7.92±2.35	<0.05
Hematocrit	27.01±4.58	
Urine albumin	38.56±6.83	
eGFR	7.10±1.54	
BUN	69.03±10.01	

Hb: Hemoglobin, eGFR: Estimated glomerular filtration rate, BUN: Blood urea nitrogen, ESRD: End stage renal disease

(27.01±4.58), urine albumin (38.56±6.83), estimated glomerular filtration rate (eGFR) (7.10±1.54) and BUN (69.03±10.01) values.

The present study assessed all the four domains of KDQOL in the study subjects. PH was the significantly affected domain among all the four domains of the KDQOL and an average score was found to be 25.45±11.85% (p=0.0015). An average score of 34.50±13.95% was observed for MH and was found to be better than the PH and it was statistically significant (p<0.018). Issues related to kidney disease had an average score of 40.75±17.65% (p=0.0024) which is comparatively affected domain. An average value of 71.93±12.35% (p=0.029) of the subjects had satisfactions with dialysis care and which is lower than the recommended value of <65% (as per the guidelines given by NKF).

The present study also compared different laboratory variables with the four domains of the KDQOL and among the four domains of the KDQOL by using Pearsons's correlation coefficient and they were found to be statistically significant. There was a positive correlation of Hb/hematocrit and adequacy of dialysis with all the four domains of the KDQOL. The data were represented in Table 2.

DISCUSSION

ESRD is one among the chronic diseases which possess great threat globally and increased burden in healthcare system. ESRD leads to increased morbidity and mortality and reduced QOL [12]. In the present study, above 50 years of age group were majority affected and a mean of six medications were administered to the ESRD patients. The result of the present study is similar to the previous studies conducted and reported by the Rani *et al*., 2013. They have also reported that these groups of ESRD patients have higher incidence and prevalence and the average of six medications were prescribed per patient [13]. Hemodialysis patients have multiple co-morbid conditions which often necessitates the use of many drugs. 68% of the patients in this study were having multiple comorbidities and 32% were having single comorbidity which necessitating the use of polypharmacy and complicated therapeutic dosage regimen in majority of the patients.

In our study, 28 (56%) subjects were on regular hemodialysis and 22 (44%) subjects were on regular peritoneal dialysis and all 50 subjects were on drugs. In the present study, the following comorbidities were observed in the enrolled subjects; diabetes mellitus, chronic glomerulonephritis, cardiac and pulmonary diseases, rheumatologic arthritis and peptic ulcer disease. Diabetes mellitus was found to be the most frequent cause of ESRD, 39 (78%) [14-17] followed by chronic glomerulonephritis 10 (20%) and few of them were having multiple comorbid conditions also. The study subjects were having altered laboratory values, which were raging from moderate to severe. An average level of hemoglobulin (7.92±2.35), hematocrit (27.01±4.58), urine albumin (38.56±6.83), eGFR (7.10±1.54), and BUN (69.03±10.01) values. The previous studies reports were based on few parameters to assess the effect of the disease and RRT. Diabetes mellitus (78%) and chronic glomerulonephritis (20%) were the most commonly observed comorbidities among the CKD patients. Other causes of ESRD found in our study were cardiac and pulmonary diseases/ rheumatologic/peptic ulcer disease.

The URR was used to calculate the adequacy of dialysis in CKD patients undergoing hemodialysis. The recommended normal value is >65% shows that the dialysis is adequate. In the present study, 63.87±15.43% an average URR was calculated it shows that the patients undergoing dialysis were adequate. Literature review shows that in many studies the lower were only achieved and recommended also this is due to many factors like physiological variation among the patients, duration of dialysis and dialyzing method etc., which will affect the adequacy of dialysis. QOL is related to adequacy of dialysis.

Table 2: KDQOL domain scores in the ESRD patients

Domain	Average score (%)	p value one-way ANOVA
PH	25.45±11.85	0.0015
MH	34.50±13.95	0.018
KID	40.75±17.65	0.0024
PS with dialysis care	71.93±12.35	0.029

PH: Physical health, MH: Mental health, KID: Kidney diseases issues, PS: Patient satisfaction, KDQOL: Kidney disease quality of life, ESRD: End stage renal disease

The present study assessed all the four domains of KDQOL in the study subjects. PH was the significantly affected domain among all the four domains of the KDQOL and an average score was found to be 25.45±11.85 (p=0.0015). An average score of 34.50±13.95 was observed for MH and was found to be better than the PH and it was statistically significant (p=0.018). Issues related to kidney disease were having an average score of 40.75±17.65 (p=0.0024), which is comparatively affected domain. An average value of 71.93±12.35 (p=0.029) subjects was having satisfactions with dialysis care and which is lower than the recommended value <65% (as per the guidelines given by NKF) [18]. The present study have revealed that there is significant correlation between PH, MH and kidney function, whenever there is problem in kidney PH and MH get affected.

Limitations of the study is may not reflect the true distribution of CKD patients in the entire population of Indian country as study was conducted in a referral hospital and the other limitation is the present study has not compared many factors, which governs the QOL.

CONCLUSION

Though the physical and psychological parameters were showing improved conditions but physical domains was highly affected and followed by mental domain. There is no significant difference in QOL for CKD patients under hemodialysis or peritoneal dialysis. The present study also compared with different laboratory variables with the four domains of the KDQOL and among the four domains of the KDQOL by using Pearsons's correlation coefficient and it was found to be statistically significant and there was a positive correlation of Hb/hematocrit and adequacy of dialysis with all the four domains of the KDQOL.

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