INTERNATIONAL JOURNAL
OF
PHARMACEUTICAL SCIENCES
AND
RESEARCH

ASSESSMENT OF QUALITY OF LIFE IN DIALYSIS AND NON-DIALYSIS CHRONIC KIDNEY DISEASE PATIENTS

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ABSTRACT: Quality of life is an essential measure that proves the effectiveness of health care, health level, and well-being. Kidney diseases are one of the major health problems that affect Quality of life. This study aimed to assess the quality of life in dialysis (CRF-D) and non-dialysis (CRF-ND) chronic renal failure (CRF) patients using Kidney Disease Quality of Life-short form (KDQOL-SF^{TM}) and identify the differences in disease symptoms between these two groups. 200 CRF patients were included in the study. Our findings showed that some symptom burden was higher in the non-dialysis group compared to the dialysis group, but most of the symptoms did not reach statistical significance. Similarly, our results indicate no differences in quality of life and symptoms between CRF patients with dialysis and without dialysis.

INTRODUCTION: Chronic renal failure is one of the slow, gradual, and irrevocable loss of renal function, contributing to the failure of kidneys to accomplish their basic functions. The incidence and prevalence in patients with chronic kidney disease (CKD) are growing worldwide. The problem is associated with high morbidity and mortality throughout the procession from the early stage of the disease. Although very much progress has been made in prevention, detection, and treatment, CKD remains a major public health issue. Its global prevalence is generally estimated at 5-10%. CKD prevalence is contentious. Statistics from the American National Health and Nutrition Examination Survey show that in the period of

1999 to 2004, the prevalence of CKD stages 1 to 4 increased significantly when compared to their previous report (13·1 versus 10·0%). Prevalence is increased mainly due to the aging population; it is also connected with increases in prevalence of hypertension and diabetes mellitus [1-3]. Because of cardiovascular morbidity and mortality, the global burden of CKD-associated diseases is alarmingly large.

The World Health Organization (WHO) has defined Quality of life (QOL) as "an individual's perception of their position in life in the context of the culture and value systems in which they live and about their goals, expectations, standards, and concerns" [4]. QOL is an important outcome, utilized as a valuable parameter to measure health and well-being. Research conclusions have shown that lower results on QOL were firmly associated with a higher risk of fatality and hospitalization than clinical parameters such as serum protein levels in cases of CKD sufferers. Numerous studies have shown that individual with CKD had reduced QOL

compared to healthy people. Therefore, improving CKD patients' life span as well as QOL features utmost significance. Health-related QOL contains physical, psychological, and social domains of health, every of which includes diversity in components. Moreover, each element can be expressed in different approaches according to the individual perception of every patient, resulting in a different evaluation of QOL. Two patients with the same clinical conditions may assess QOL differently because the perception is the result of the communication between the patient's living conditions and how these are perceived by the patient. This study aimed to assess the quality of life in dialysis (CRF-D) and non-dialysis (CRF-ND) chronic renal failure (CRF) patients. Kidney Disease Quality of Life-short form (KDQOL-SF[TM]) version 1.3 was used in this to study the QOL of two group patients. KDQOL-SF[TM] is a multidimensional, reliable, and validated questionnaire proposed for dialysis patients [5]. It has 43 domains. In KDQOL-SF[TM] two questions connecting to dialysis staff encouragement and patient satisfaction that are usually part of the disease-specific component of the KDQOL-SF[TM] were excluded as they were not relevant to the population under assessment as reported earlier [6]. The question associated with the sexual function was also excluded.

METHODOLOGY:

Study Design: Observational and prospective study.

Study population covered of 200 patients with CRF collected from nephrology department of a tertiary care hospital, Erode. CRF patients undergoing dialysis and not on dialysis aged 18 years and above of either sex and be able to provide informed consent to participate were included in the study. Renal transplant patients were excluded. The entire work was carried out according to the approval granted by the Institutional Human ethics committee (IEC approval number (JKKNCP/IEC/ 54892J17). Written consent was attained from participants before the study. Demographic data recorded were age, gender, educational status, financial status, and co-morbidities were collected. The patients were divided into two groups, CRF on dialysis (CRF-D, n = 74) and CRF not on dialysis (CRF-ND, n = 126). The KDQOL-SFTM existed in

the English version. Even though KDQOL-SF™ is a self-reported questionnaire, seeing the high proportion of illiterate participants, in this study, questionnaires were administered by an interview to all the study participants. The interviewer only explained the meaning of questions for illiterate patients. The scoring algorithm was used to compute scores ranging from 0 to100. The scores signify the percentage of the total possible score achieved, with 100 representing the highest quality of life.

RESULTS AND DISCUSSION: Impact of CRF treatment on patients' quality of life is being recognized as an important outcome measurement tool. The main aim of treatment in individuals with chronic medical conditions, such as CRF, is to reduce disease burden and to struggle caused by the disease. By improving the overall wellness of the patient's, we can improve the individual's Quality of Life. The Kidney Disease Quality of Life Questionnaire-Short Form (KDQOL-SF[TM]) has become the most widely used QOL measures for CRF patients. In this research work quality of Life of CRF patients on dialysis (CRF-D) and CRF patients not on dialysis were compared using KDQOL-SF[TM] scores to study the relationship between QOL and the possible outcomes. Demographic profiles of the study population were studied **Table 1**. In CRF-D group, 59.4% were male patients, and female patients were 40.5%, whereas CRF-ND group, 56.3% were male patients, and 43.6% were female. Presently evidence about gender differences in CRF is limited and conflicting. Some studies showed that men have a more incidence and prevalence of end-stage renal disease (ESRD) than women [7, 8]. In a meta-analysis study, a substantial correlation between male gender renal diseases was observed in the progression of IgA nephropathy, autosomal dominant, polycystic disease, and membranous nephropathy. It may be due to variation if sex hormones [9]. Some animal studies revealed the destructive effect of testosterone and defensive effect of estrogen in the Kidney. Testosterone induces podocyte apoptosis and TGF-β expression in kidney, but estradiol inhibits the process [10].

Among them, most of the CRF-D patients were in the age group of more than 60 years (44.5%) followed by 51-60 years (25.6%), 41-50 years

(17.5%) and less than 40 years (12.1%). CRF-ND patients were more in the age group of more than 60 years (37.3%) followed by 51-60 years (24.6%), 41-50 years (21.4%) and less than 40 years (16.6%). In both groups, most of the participants were over 60 years. In general, older people have more risk factor for the development of CKD. After the age of 40 years, glomerular filtration reduced approximately 1% per year [11]. This age-related decline in renal function reduces the kidney function in the elder population.

TABLE 1: DEMOGRAPHIC CHARACTERISTICS OF STUDY POPULATION

Gender	CRF-ND (n=126)	CRF-D (n=74)
Male	71(56.3%)	44(59.4%)
Female	55(43.6%)	30(40.5%)
Age (in years)		
<40	21(16.6%)	09(12.1%)
41-50	27(21.4%)	13(17.5%)
51-60	31(24.6%)	19(25.6%)
>60	47(37.3%)	33(44.5%)
Co-morbidities		
Hypertension	107(84.9%)	69(93.2%)
Ischemic Heart Disease	63(50.0%)	47(63.5%)
Diabetes Mellitus	93(73.8%)	59(79.7%)
Anaemia	98(77.7%)	63(85.1%)
Others	47(37.3%)	27(36.4%)
Educational status		
Illiterate	53(42.0%)	31(41.8%)
School	45(35.7%)	25(33.7%)
Degree	28(22.2%)	18(24.3%)
Monthly per capita income (INR)		
<5000	48(38.0%)	28(37.8%)
5000 – 15000	64(50.7%)	37(50.0%)
>15000	14(11.1%)	09(12.1%)
Marital Status		
Married	95(75.3%)	56(75.6%)
Divorced	22(17.4%)	11(14.8%)
Single	9(7.1%)	7(9.4%)

TABLE 2: LABORATORY DATA OF STUDY POPULATION

Laboratory Data	CRF- ND (Mean ± SD)	CRF- D (Mean ± SD)	P Value
Hb(g/dl)*	11.7±1.2	11.2 ± 1.8	0.01
Serum Urea(mg/dl)*	82.4 ± 32.9	127 ± 30.3	0.03
Serum calcium (mg/dl)*	9.1 ± 0.5	9.0 ± 1.0	0.01
Serum albumin (mg/dl)*	3.8 ± 0.5	3.6 ± 0.6	0.04
Serum Phosphorous (mg/dl)*	4.1 ± 0.7	4.9 ± 0.8	0.01

*P<0.05. CKD ND: CKD –D

Hypertension, Ischemic Heart Disease, Diabetes Mellitus, and Anemia are the co-morbid diseases commonly found with CKD patients. In this study,

most of the CRF-D patients have hypertension (93.2%), followed by anemia (85.1%), Diabetes mellitus (79.7%), Ischemic Heart Disease (63.5%) and other diseases (36.4%). Most of the CRF-ND patients have hypertension (84.9%), followed by anemia (77.7%), Diabetes Mellitus (73.8%), Ischemic Heart Disease (50.0%) and other diseases (37.3%). Diabetes, hypertension, and CRF are significantly interlinked. About one-third of diabetic patients develop diabetic kidney disease. The prevalence of CRF was 10.6% and 12% in the hypertensive and diabetic patients, respectively. There is a strong link between hypertension CKD.

Hypertension alters the systemic and renal micro and macro vasculature; it leads to the damage of renal auto-regulation with raise of intraglomerular capillary pressure and the resulting hyperfiltration mediated renal injury. And also hypertension activates the intrarenal renin-angiotensin system, which increases the release of cytokines and stimulates apoptosis and induces interstitial fibrosis in kidney [12]. Diabetes is the one primary risk factor of kidney disease. Approximately 40% of adults with diabetes have renal disease. Diabetes changes the thickness of the glomerular basement membrane, which leads to renal damage.

TABLE 3: PREVALENCE OF SYMPTOMS IN STUDY POPULATION

Prevalence of symptoms	CRF-ND(n=126)	CRF- D (n=74)	P Value
Feeling fatigued	108(85.7%)	55(74.3%)	0.41
Upsetting	87(69.0%)	41(55.4%)	0.82
Problem in sleep	73(57.9%)	30(40.5%)	0.37
Itching	92(73.0%)	55(74.3%)	0.81
Feeling depressed*	41(32.5%)	19(25.6%)	0.03
Bone and joint pain	43(34.1%)	21(28.3%)	0.77
Muscle cramps	83(65.8%)	42(56.7%)	0.15
Dry mouth	79(62.6%)	37(50.0%)	0.04
Constipation	31(24.6%)	26(35.1%)	0.44
Swelling legs	29(23.0%)	11(14.8%)	0.11
Feeling nervous	41(32.5%)	21(28.3%)	0.25
Headache	47(37.3%)	22(29.7%)	0.12
Diarrhoea	31(24.6%)	14(18.9%)	0.68
Decreased appetite	41(32.5%)	20(27.0%)	0.43
Cough	44(34.9%)	21(28.3%)	0.67
Nausea	43(34.1%)	22(29.7%)	0.19
Vomiting	41(32.5%)	24(32.4%)	0.61
Numbness in feet	51(40.4%)	28(37.8%)	0.18
Suppressed breathing*	40(31.7%)	19(25.6%)	0.01
Decreased interest in sex	27(21.4%)	16(21.6%)	0.27

*P<0.05. CKD ND: CKD –D

In severe diabetes, it causes interstitial, and glomerulopathy coalesces, which finally causes segmental and global sclerosis [13]. In our study majority of patients were affected by Anemia. It may be vitamin deficiencies such as B12 and folate are relatively and erythropoietin deficiency [14, 15].

In our study, 41.8% (CRF-D) and 42.0% (CRF-ND) patients were Illiterates. 35.7% (CRF-ND) and 33.7% (CRF-D) of patients had education up to school level. About 75% of the CRF-D and CRF-ND patients are married. CRF-D (9.4%) and CRF-ND (7.1%) patients are single in the study population. Only 20% of the study population completed degree. The Individual monthly incomes of 50% of the CRF-D and CRF-ND patients were between 5000 and 15000 rupees per month. Only CRF-D (12.1%) and CRF-ND (11.1%) have a monthly wage of 15000 rupees. Prevalence of symptoms was studied in the study population. Feeling fatigued and lack of energy, worrying, Itching, feeling depressed, bone and joint pain, muscle cramps, dry mouth, constipation, swelling legs, feeling nervous, headache, diarrhea, decreased appetite, nausea, vomiting, numbness in feet, suppressed breathing, decreased interest in sex are the prevalence of symptoms connected with the study population.

The most prevailing symptoms in the dialysis patients were feeling fatigued and lack of energy (74.3%), itching (74.3%), worrying (55.4%), and muscle cramps (56.7%). Non-dialysis patients generally felt like feeling tired and lack of energy (85.7%), worry (69.0%), itching (73.0%), and muscle cramps (65.8%). Feeling fatigued and lack of energy was the most prevalent symptom across all groups.

In this study, nausea and decreased appetite were reported frequently. This study shows that certain symptoms were higher in the non-dialysis patients, compared to the dialysis group, but most of the symptoms are not statistically significant. Feeling depressed (p<0.03) and suppressed breathing (p<0.01) have significant difference in the CRF-D and CRF-ND patients. Similar results were obtained by Abdel-Kader *et al*.[16]

TABLE 4: KDQOL DOMAIN SCORES IN STUDY POPULATION

| Kidney disease-specific domains	CRF- ND (Mean ± SD)	CRF- D (Mean ± SD)	P Value
Symptoms/problems	79.37 ± 14.11	77.35 ± 12.25	0.60
Effect of Kidney Disease	66.13 ± 14.07	74.66 ± 13.44	0.11
Burden of kidney disease	27.41 ± 17.06	34.15 ± 21.07	0.55
Work status	43.43 ± 26.15	40.39 ± 32.62	0.12
Cognitive	72.91 ± 18.19	62.52 ± 20.17	0.23
Quality of social interaction	77.66 ± 20.42	75.91 ± 19.72	0.22
Sleep	65.88 ± 22.28	65.22 ± 18.37	0.29
Social support	86.15 ± 22.71	78.21 ± 23.86	0.16
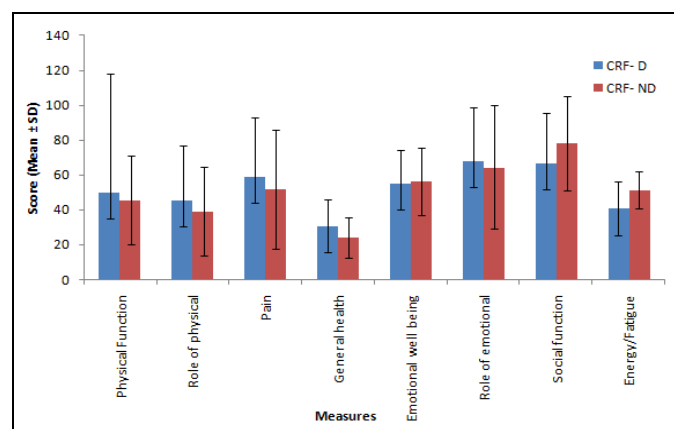
FIG. 1: KDQOL DOMAIN SCORES IN STUDY POPULATION

Quality of Life in Patients not on Dialysis: In Patients not on dialysis the KDQOL-SF[TM] scale were ranged from 40.39 to 81.37. In kidney disease targeted scales burden of kidney disease (27.41 ± 17.06), cognitive function (72.91 ± 18.19), quality of social interaction (77.66 ± 20.42). Effects of kidney disease (66.13 ± 14.07), work status (43.43 ± 26.15) whereas symptom/problem list (81.37 ± 12.22), Sleep (65.88 ± 22.28) and social support (86.15 ± 22.71).

Quality of Life in Patients on Dialysis: In Patients not on dialysis the KDQOL-SF[TM] scale were ranged from 40.39 to 81.37. Kidney disease targeted scales showed that burden of kidney disease (34.15 ± 21.07), Quality of social interaction (75.91 ± 19.72) cognitive function (65.52 ± 20.17), effects of kidney disease (74.66 ± 13.44), work status (40.39 ± 32.62) had mean score below 50 whereas symptom/problem list (77.35 ±

12.25), sleep (65.22 ± 18.37), social support (78.21 ± 23.86) had mean score of above 50. There was no significant change in the KDQOL-SF[TM] overall scores among the two group patients. A similar study was conducted by Cheung *et al*. [17]

CONCLUSION: The exact measure of QOL in patients with renal disease is very challenging. Some items like subjective and objective tools, generic and disease-specific scales are commonly used to measure QOL in patients with renal disease. A challenge rests on making these domains clinically significant. Our findings show that some symptom burden was higher in the non-dialysis group compared to the dialysis group, but most of the symptoms did not reach statistical significance. Similarly, our results indicate no differences in quality of life and symptoms between CRF patients with dialysis and without dialysis. But the individual assessment of the quality of life is multifactorial, and the development of renal dysfunction may not be the only factor. Some limitations of the present study are the comparatively lesser sample size to identify significant changes between the two groups. The cross-sectional design was conducted to define the associations between variables and not causal relationships. Longitudinal studies are required to get a better understanding of the effect of the CKD on QOL.

CONFLICT OF INTEREST: The authors declare there are no conflicts of interests regarding this study.

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