Determination of quality of life in patients with chronic renal disease undergoing hemodialysis; a tertiary care experience

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Abstract: Objective: Our objective is to determine the Quality of Life (QoL) in chronic renal disease patients, to evaluate the pros and cons of dialysis in improving the QoL and to suggest an improved system of healthcare services provided to the patients.

Introduction: Chronic kidney disease (CKD), also known as chronic renal disease, is a progressive loss in renal function over a period of months or years. In medicine, Dialysis is a process for removing waste and excess water from the blood, and is used primarily as an artificial replacement for lost kidney function in people with renal failure. Chronic renal disease has many complications which can decrease the QoL.

Material and methods: A prospective case control study was conducted on 40 patients admitted to urology department of Mayo Hospital, Lahore for hemodylasis. Data was collected on a preformed questionnaire of WHO about QoL. Some demographic variables like age, education and income of the patient were added to the standard WHO QoL questionnaire.

Results: WHO QoL questionnaire for both case and control groups had a significant p-value in four domains including overall QoL ($p = 0.001$), physical health ($p = 0.001$), psychological health ($p = 0.001$) and environmental health ($p = 0.001$).

Conclusion: CKD treatment and in particular dialysis can decrease the QoL due to multiple effects. The major aspects of life affected in an individual undergoing dialysis are physical health, psychological health and environmental health.

Keywords: Quality of life (QoL); dialysis; end-stage renal disease (ESRD)

1. Introduction

Chronic kidney disease (CKD), also known as chronic renal disease, is a progressive loss in renal function over a period of months or years. It is differentiated from acute renal failure in that the decrease in renal function must be present for over 3 months. CKD is a worldwide problem with increasing incidence, prevalence, high treatment cost with poor outcomes[1]. The leading causes of CKD include Glomerulonephritis, High Blood Pressure and Diabetes. This disease may also be identified when it leads to one of its recognized complications, such as cardiovascular disease, anemia, or pericarditis[1].

Recent professional guidelines classify the severity of CKD in five stages on the basis of GFR, with stage 1 being the mildest and usually causing few symptoms and stage 5 (also known as End Stage Renal Failure) being a severe illness mildest and usually causing few symptoms and stage 5 (also known as End Stage Renal Failure) being a severe illness

with poor life expectancy if untreated. In medicine, Dialysis is a process for removing waste and excess water from the blood, and is used primarily as an artificial replacement for lost kidney function in people with renal failure. Dialysis is regarded as a "holding measure" until a renal transplant can be performed, or sometimes as the only supportive measure in those for whom a transplant would be inappropriate. There are various types of dialysis including Haemodialysis, peritoneal dialysis, and intestinal dialysis etc. Chronic kidney disease resulted in 956,000 deaths in 2013 up from 409,000 deaths in 1990[2].

PInitially, CKD is without specific symptoms and is generally only detected as an increment in serum creatinine or protein in the urine. Chronic renal disease has many complications which can decrease the QoL[3]. The results of a study conducted on 634 patients showed that the QoL in patients with chronic renal disease either undergoing hemodialysis or not, is affected[4]. The children with CKD are somewhat more prone to growth hormone related effects and tend to show the signs of growth retardation[5]. The patients with CKD are at higher risk for developing CVS diseases as revealed by an assessment of 433 patients at the start of end-stage renal disease (ESRD) therapy. It showed that 31% had CHF, 19% had angina and 14% had CAD[6]. Anemia occurs frequently in CKD patients with serious consequences. A research showing data collected from 37,105 CKD patients showed that, out of 37,105 CKD patients, 9,807 (26%) had incident anemia; 59% of these received at least one type of anemia treatment, with 48% receiving an erythropoiesis-stimulating agent[7]. Patients with CKD also showed an increase incidence for psychiatric disorders[8] and a decline in sexual functionality associated with them[9]. Hyperparathyroidism occurs in most patients during the progression of chronic kidney disease (CKD) and one of its initiating events, a reduced serum levels of 1,25-dihydroxyvitamin D results from decline in renal alpha-1 hydroxylase activity, which converts 25-hydroxyvitamin D to its activated form. The combination of persistently high parathyroid hormone (PTH) and low 1,25-dihydroxyvitamin D is associated with bone loss, cardiovascular disease, immune suppression[10] which results in increased mortality in patients with end-stage kidney failure[11]. Women with moderate to severe CKD (stages 3–5) are at highest risk of complications during pregnancy and an accelerated decline in renal function. A retrospective series of women with chronic kidney disease (87 pregnancies) found that those who initially had moderate renal impairment had a 40% risk of a decline in renal function during pregnancy, which persisted after child birth in about half of those affected. However, 13 out of 20 women with severe renal impairment had a decline in renal function during the third trimester, which persisted in most women and deteriorated to end stage renal failure in seven[12]. The rationale for conducting this research project is to increase awareness about the ignored aspects of health of the patients with CKD so that the healthcare services provided to patients might be improved.

Our objective is to determine the QOL in chronic renal disease patients, to evaluate the pros and cons of dialysis in improving the QOL and to suggest an improved system of healthcare services provided to the patients.

2. Material and methods

A prospective case control study was conducted on 40 patients admitted to urology department of Mayo Hospital, Lahore for hemodylasis. With simple randomization, patients were divided into case and control groups pertaining equal participants.   Study duration was from March 2016 to June 2016.

Chronic Kidney Disease patient of any age and gender undergoing Dialysis, may or may not having complications of CKD like cardiovascular disease, anemia, or pericarditis were included in our research. CKD patients not undergoing Dialysis, patients having infectious disease, psychiatric complications, any malignancy, critically ill patients and those undergoing any other therapy were excluded. Unwilling and non-cooperative participants were also excluded from our study.

Data was collected on a preformed questionnaire of WHO about QoL. Some demographic variables like age,

education and income of the patient were added to the standard WHO QoL questionnaire. WHO QoL questionnaire comprises of five different domains including overall QoL and health, physical health, psychological health, social relationships and environmental health. All domains collectively pertains 26 different variables. Each possible response was numbered from 1 to 5. The next step involves transforming the raw score into the scale of 0–100 using the formula given below:

$$\text{Transformed Scale} = \left[\frac{(\text{Actual raw score - lowest possible raw score})}{\text{Possible raw score range}} \right] \times 100$$

Data was entered and analyzed by using Statistical Package for Social Sciences (SPSS) version 20. Mean values and standard deviations were calculated. p-values of <0.05 were considered significant in our study.

3. Results

Total 40 participants in our study were divided into control group and case group of 20 patients each after simple randomization. The most frequent presenting age in control group was about 22–23 (n = 7) years old patients and in case group, it was 40(n = 4) years of age. In control group, the percentage of patients with income of <20000 (35%) or equal to 20000–40000 (35%) was greater. While in case group, participants with income of 20000-40000 (35%) had the greater percentage. Most participants in control group has studied up to Fsc/FA (n = 7) whereas the educational status of case group showed equal distribution among Primary (n = 4), Msc/MA (n = 4) and Middle school education (n = 4).

Details regarding demographic data of patients belong to control group is tabulated in Table 1 and Table 2. For case group, frequencies and percentages of demographic variables are given in Table 3 and Table 4.

WHO QoL questionnaire for both case and control groups had a significant p-value in four domains including overall QoL ($p = 0.001$), physical health ($p = 0.001$), psychological health ($p = 0.001$) and environmental health ($p = 0.001$). Details about the statistics of WHOQoL questions are given in Table 3.1:

Table 1 Frequency and percentage of age in control group

Age (Control)1 Title2 Title3				
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
18	1	5.0	5.0	5.0
20	1	5.0	5.0	10.0
21	1	5.0	5.0	15.0
22	3	15.0	15.0	30.0
23	4	20.0	20.0	50.0
24	1	5.0	5.0	55.0
25	1	5.0	5.0	60.0
28	1	5.0	5.0	65.0
30	1	5.0	5.0	70.0
32	1	5.0	5.0	75.0
35	1	5.0	5.0	80.0

		Frequency	Percent	Valid Percent	Cumulative Percent
	39	1	5.0	5.0	85.0
	40	1	5.0	5.0	90.0
	45	1	5.0	5.0	95.0
	46	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

Table 2 Frequency and percentage of monthly income in control group

Income (Control)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Missing	4	20.0	20.0	20.0
	<20000	7	35.0	35.0	55.0
	20000-40000	7	35.0	35.0	90.0
	40000-60000	2	10.0	10.0	100.0
	Total	20	100.0	100.0	

Table 3 Frequency and percentage of age in case group

Age (Case)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15	1	5.0	5.0	5.0
	25	1	5.0	5.0	10.0
	29	1	5.0	5.0	15.0
	30	1	5.0	5.0	20.0
	31	1	5.0	5.0	25.0
	33	1	5.0	5.0	30.0
	35	1	5.0	5.0	35.0
	38	1	5.0	5.0	40.0
	40	4	20.0	20.0	60.0
	42	1	5.0	5.0	65.0
	45	2	10.0	10.0	75.0
	50	2	10.0	10.0	85.0
	60	2	10.0	10.0	95.0
	67	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

Table 4 Frequency and percentage of monthly income in case group

Income (Case)					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Missing	4	20.0	20.0	20.0
	<20000	5	25.0	25.0	45.0
	20000-40000	7	35.0	35.0	80.0
	40000-60000	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

Table 5 Mean values and SD of all domains of WHOQoL

Variable	N	Mean ± Standard Deviation		95% Confidence interval of the difference		t	Sig. (2-tailed)
		Control	Case	Lower	Upper		
Overall QoL	20	73.125 ± 13.62	38.75 ± 17.16	23.17	45.58	6.419	0.001
Physical Health	20	68.04 ± 11.08	42.5 ± 13.7	16.91	34.17	6.193	0.001
Psychological Health	20	67.49 ± 13.8	44.58 ± 15.1	12.49	33.34	4.601	0.001
Social Relationships	20	67.916 ± 13.85	64.99 ± 11.02	-5.50	11.34	0.725	0.477
Environment	20	66.25 ± 6.85	45.46 ± 12.52	14.29	27.27	6.698	0.001

4. Disscusion

QoL in chronic kidney disease patients has been the topic of interest for community healthcare facilities. There has been substantial debate about the role of chronic kidney diseases in affecting QoL. Our research on population belongs to developing country shows that physical, psychological, environmental as well as overall QoL and health is immensely affected in such patients.

Age is the single most independent factor for developing CKD. A survey on US population showed that chronic kidney diseases are more common after the age of 65 years[13]. In our study, most patients presented with CKD were between 40 to 60 years (n = 11) of age.

Affordability of treatment expenditures in patients with CKD is a common factor which can affect QoL. A study conducted by Holley et al. reported that most patients (67%) don't have enough money to continue the treatment for prolonged period[14]. Most of the participants in our research had monthly wages of around 20,000–40,000 rupees.

Existing literature proposes an association between Dialysis and depression. Patients of ESRD are more prone to develop depression and anxiety due routine challenges faced with dialysis procedure[15]. A cross-sectional study conducted was concluded that patient-defined losses are a contributing factor for depression in patients with CKD[16]. Our research also suggested an inclination along the same lines. Psychological health of CKD patients was significantly (p = 0.001) affected in our study. Patients are generally dissatisfied with their lives

Physical health is a major concern in patients with chronic illnesses. Bedridden patients are prone to develop poor health over the complete time course of disease. Gorodetskaya I et al. conducted a survey on patients with stage 4 and 5 CKD. The study showed that physical health-related QoL was significantly affected[17]. A randomized pilot study suggested that moderate exercise can reduce physical impairment in patients of CKD and improve the QoL [18].

Social relationships are not affected much. Most of the patients have satisfactory family and sex lives. Patients get support from family and friends which results in quick recovery and less psychosocial disorders[19]. It is essential to assess the environmental health in patients with chronic kidney disease. A study by C. M. Gudex et al. on 997 CKD patients suggested that dialysis results in more significant reduction in leisure time activity and overall QOL as

compared to patients of renal transplant[20]. In our research, environmental health ($p = 0.001$) and overall QoL ($p = 0.001$) was significantly affected in presenting patients of CKD.

The main limitation of our study was smaller sample size.

5. Conclusions

CKD treatment and in particular dialysis can decrease the QoL due to multiple effects. The major aspects of life affected in an individual undergoing dialysis are physical health, psychological health and environmental health. To prevent that, the complex riddle of various "cause and effect" relationships involved in this decline needs to be solved. Our study is a step towards this particular goal..

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