ORIGINAL ARTICLE

Quality of Life of Dialysis Patients in Malaysia

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Summary

The aims of this retrospective analysis were (i) to examine the trends of quality of life (QoL) scores and (ii) to identify the risk factors for QoL scores among 6908 dialysis patients entering dialysis between 1997 and 2002. The Spitzer QoL Index was the instrument used by the National Renal Registry of Malaysia to assess the QoL amongst dialysis patients. Demographic and biochemical data were analysed to identify risk factors for poor QoL. The median QoL-index score ranged between 9 and 10. Significant risk factors for poor QoL were female gender, age >40, diabetes, cohort starting dialysis 2001-2002, haemodialysis modality, body mass index <18.5, albumin < 30g/dL, cholesterol < 3.2 mmol/L, haemoglobin < 10 g/dL, diastolic blood pressure of > 90 mHg, iPTH <100 pg/ml. The overall QoL of dialysis patients is satisfactory. The negative impact of diabetes and haemodialysis on QoL warrants further evaluation as each factor involves 50% and 90% of our dialysis population.

Key Words: Quality of life, Renal registry, Haemodialysis, Continuous ambulatory peritoneal dialysis

Introduction

Quality of life has been defined in many ways over the years. This concept is a very complex one and has not been well defined[1]. Functional status and well being outcomes provide patient indicators of QoL[2]. It has been defined as the extent to which a person's sense of well being stems from satisfaction or dissatisfaction with the aspects of life that are important to the individual[3]. It is the concept representing individual responses to the physical, mental and social effects of illness on daily living that influence the extent to which personal satisfaction with life circumstances can be achieved[4]. Dialysis treatment does have considerable impact on patients' lifestyle. The treatment is time consuming and is not without adverse effects. The fluid and dietary restrictions required of patients on dialysis further impact on their QoL.

The provision of dialysis treatment in any country is historically driven by its life saving capability. This remains the fundamental reason for providing dialysis even today. It is increasingly realized that such large investments in resources that benefit relatively few patients should show impact on not just gross outcomes such as survival but also the quality of life (QoL).

There is increasing interest in the determinants of QoL on dialysis. Outcome of such studies, especially of treatment modifiable factors, has obvious potential to change clinical and dialysis practices to improve patients' QoL.

A number of factors have been associated with QoL outcomes. Increasing age[1, 5-10], anemia[5, 10-13], nutritional status as evaluated by its markers like body mass index, serum albumin[9, 11, 14-16] and cholesterol have strong and predictable adverse effects on patients' QoL, while the effect of gender was not consistent[9, 11, 14-16]. Whether treatment modality i.e. HD or CAPD has differing effects on QoL remains controversial[7, 17].

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In this article, we describe the QoL outcomes of patients on Haemodialysis (HD) and Continuous Ambulatory Peritoneal Dialysis (CAPD) in this country. We also examine the influence of various patients' and treatment characteristics on these outcomes. Analysis is confined to the inception cohort consisting of 6908 HD and CAPD patients who commenced dialysis between 1997 and 2002.

Materials and Methods

The National Renal Registry (NRR) in Malaysia has been collecting data on patients' demographics, primary renal disease, body mass index (BMI), albumin, cholesterol, haemoglobin, diastolic blood pressure, intact parathyroid hormone, Kt/V and QoL since 1994. The instrument used for measuring quality of life, the Spitzer's QoL index, contains five items. Each item measures a dimension of quality of life. The 5 dimensions covered are activity level, activities of daily living, feeling of healthiness, social support and psychological outlook. Each dimension is scored on a scale from 0 (worst health) to 2 (best health). The 5 scores are summed to give a total ranging between 0 and 10. The instrument was administered by a staff member of each dialysis centre. All staff had received prior training and instruction on how to use the instrument. The instrument was previously validated in the same dialysis population [18].

Measurement of haemodialysis adequacy was done by calculating single pool Kt/V (using computational software) which is a dimensionless ratio representing fractional urea clearance. K is the dialysis blood water urea clearance (litres/hour), t is dialysis session length (hours) and V is the distribution volume of urea (litres). Minimum delivered dose of haemodialysis is 1.2 according to current practice. For QoL outcome (measured on an ordinal scale), the cumulative odds ratio for a factor that affected the outcome expresses the relative cumulative probability for the QoL score. The choice of target value was guided by published clinical practice guidelines.

The cumulative odds ratio associated with a factor of interest was estimated using the proportional odds model. In this model, the cumulative probabilities for the ordinal dependent variable (QoL score), after suitable transformation (logit transform), was modeled as a linear function of all the factors of interest (covariates).

Results

Up to 2003, the NRR received data from 218 HD centres and 18 CAPD centres, with a response rate of 85% and 75% respectively. Of the 6908 patients analysed, 55.5% (n=3836) were male patients and 38.9% (n=2685) were diabetics. 83.9% were on haemodialysis (n=5799). Table I shows patient characteristics. Amongst HD and CAPD patients commencing dialysis from 1997 to 2002, the median QoL-index score were 9 and 10 respectively (Figure 1), with apparent superior outcome for CAPD. There is an obvious age trend in QoL outcome as expected, with older patients having poorer QoL (Figure 2). Male patients appeared to do better on dialysis than their female counterparts (Figure 3), and predictably, diabetic subjects did worse (Figure 4).

We examined the effects of all these factors and more on QoL outcome using an ordinal regression model. As shown in Table II, adjusted for all other covariates in the model, the analysis confirmed significant risk factors for poorer QoL i.e. female gender, older age (> 40 years old), presence of diabetes, cohort starting dialysis 2001-2002, haemodialysis modality, BMI <18.5, albumin < 30g/dL, cholesterol < 3.2 mmol/L, haemoglobin < 10 g/dL, diastolic blood pressure of > 90 mHg, iPTH <100 pg/ml.

Discussion

Female patients (Table II) did have poorer QoL outcome; they were 23% less likely to have a better QoL outcome than men, which is in keeping with other reports [11, 14-16]. Similar findings were also shown in Mittal's [5] group of HD patients who had lower physical component score (SF-36 QoL questionnaire) among females than males. Kalantar-Zadeh *et al* [12] using a similar instrument but only on 65 patients, did not detect a QoL difference between gender. The reasons for the differences between gender seen in this report remained speculative and include biological factors, cultural conditioning or biases in the provision of care according to sex.

The analysis also confirmed the predictable relationship between age and QoL[9, 10] (Table II). If the cumulative odd ratio is taken as one for the age group 20-39 years, there was a consistent decline for the age groups 40-54 years and that greater than 55 years. It is possible that the impact of end stage renal failure on QoL is prominent because elderly patients who have more co-morbidities were less able to cope with life on dialysis.

Table I: Baseline population characteristics (n=6908)

Variable	Haemodialysis (n= 5799)		CAPD (n=1109)		Total (n=6908)	
Male (%)	3291 (56.7%)		545 (49.1%)		3834 (55.5%)	
	Mean	SD	Mean	SD	Mean	SD
Age (years)	50.1	14.1	42.9	18.8	49.0	15.2
Body Mass Index (kg/m2)	22.3	4.3	21.4	4.5	22.4	4.4
Albumin (g/L)	38.5	5.0	33.9	5.7	37.7	5.4
Cholesterol (mmol/L)	5.0	1.1	5.8	1.3	5.2	1.2
Diastolic Blood Pressure(mmHg)	82	10	83	10	82	10
Haemoglobin (g/dL)	9.0	1.5	9.5	1.4	9.1	1.5
Intact Parathyroid Hormone(pg/mL)	106	154	124	176	110	160

Table II: Risk factors for QoL outcome, all dialysis patients 1997-2002

Factors	n	Cumulative Odds ratio	95% CI	P value
Gender				
Male (ref.*)	3836	1.00		
Female	3072	0.77	(0.67,0.89)	0.000
Age				
<20	313	0.72	(0.49,1.05)	0.088
20-39 (ref.*)	1397	1.00		
40-54	3413	0.61	(0.50,0.75)	0.000
>=55	1785	0.22	(0.18,0.28)	0.000
Primary diagnosis				
Unknown (ref.*)	2104	1.00		
Diabetes Mellitus	2685	0.31	(0.26,0.37)	0.000
Glomerulonephritis	840	1.35	(1.07,1.71)	0.013
Polycystic kidney	111	1.33	(0.72,2.45)	0.357
Obstructive nephropathy	316	1.13	(0.82,1.55)	0.460
Others	850	1.01	(0.81,1.26)	0.953
Year start dialysis				
1997-8 (ref.*)	1761	1.00		
1999-2000	2455	0.96	(0.82,1.13)	0.631
2001-2002	2692	1.23	(1.03,1.46)	0.021
Modality				
CAPD (ref.*)	1109	1.00		
HD	5799	0.50	(0.41,0.62)	0.000
Body Mass Index				
<18.5(ref.*)	997	1.00		
18.5-<25	3366	1.29	(1.06,1.57)	0.010
≥25	1400	1.84	(1.46,2.31)	0.000
Serum albumin				
<30(ref.*)	461	1.00		
30-<35	1175	1.81	(1.37,2.57)	0.000
35-<40	2762	3.11	(2.29,4.23)	0.000
≥40	2084	5.05	(3.64,7.00)	0.000

Table II cont'd

Factors	n	Cumulative Odds ratio	95% CI	P value
Serum cholesterol:				
<3.2(ref.*)	178	1.00		
3.2-<5.2	2899	1.67	(1.12,2.48)	0.012
≥5.2	2444	1.96	(1.31,2.95)	0.001
Haemoglobin:				
<8	1441	0.53	(0.43,0.65)	0.000
8-<10	3371	0.75	(0.63,0.88)	0.001
10-<12(ref.*)	1558	1.00		
≥12	218	1.03	(0.67,1.58)	0.900
Diastolic Blood Pressure:				
<70	745	0.88	(0.71,1.09)	0.243
70-90(ref.*)	4655	1.00		
>=90	1324	0.69	(0.57,0.83)	0.000
Intact Parathyroid Hormone:				
<100(ref.*)	2849	1.00		
100-250	864	1.34	(1.13,1.60)	0.001
>=250	498	1.10	(0.88,1.38)	0.388
Kt/V (HD patients only):				
<1	331	1.15	(0.76,1.74)	0.511
1-1.2	913	1.22	(0.94,1.58)	0.144
1.2-1.4(ref.*)	1198	1.00		
1.4-1.6	999	0.99	(0.77,1.28)	0.946
>=1.6	1162	1.08	(0.81,1.43)	0.597

ref: Reference group

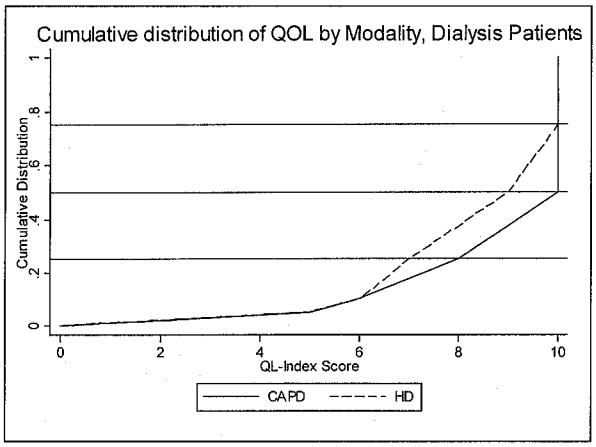

Fig. 1: Cumulative distribution of QoL-Index score in relation to dialysis modality, all dialysis patients 1997-2002

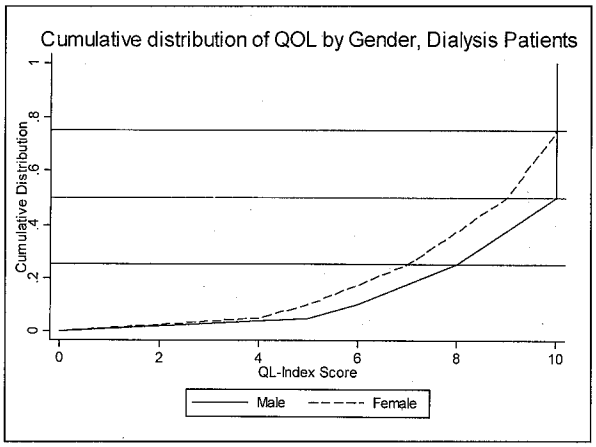

Fig. 2: Cumulative distribution of QoL-Index score in relation to gender, all dialysis patients 1997-2002

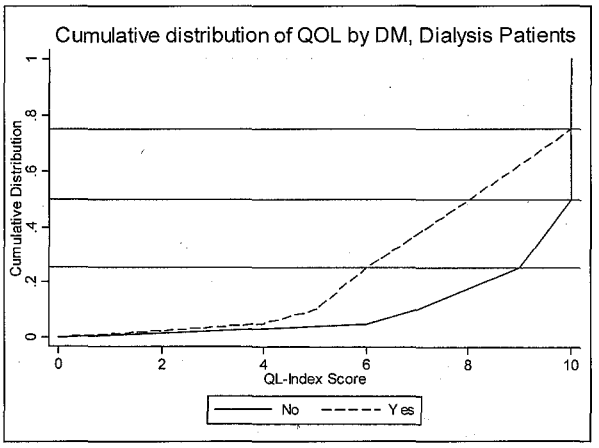

Fig. 3: Cumulative distribution of QL-Index score in relation to diabetes mellitus, all dialysis patients 1997-2002

Amongst different primary renal diseases (Table II), diabetics had the lowest chance of achieving better QoL scores, having a 69% reduced chance compared to those with unknown etiology. Diabetics have been shown to achieve poorer QoL than nondiabetics in all age groups and in all health dimensions [5, 16]. Similarly, the USRDS Annual Report 2003 showed diabetics have lower QoL score in the general health domains than nondiabetics.

Patients starting on dialysis in 2001-2002 (Table II) performed better than those in 1997-1998 a 23% higher chance of reporting better QoL scores. Such benefits can be attributed to continuing improvement of technology in dialysis and nursing care or the lack of dialysis related complications in the later cohort. Being on HD was associated with a 50% lower probability of achieving a higher QoL score as compared to CAPD (Table II). Bairardi *et al*[7] found CAPD patients enjoyed greater wellbeing in four components of the SF-36 (physical functioning, bodily pain, general health and vitality) than HD patients. Diaz-Buxo *et al* using the same instrument on 18,015 dialysis patients however, found no difference between the two groups [19]. CAPD being a home based therapy offers less disruption to individual's lifestyle. In addition, pain during needling, intradialytic symptoms and stringent fluid and dietary restrictions were common issues affecting HD patients.

There is a consistent trend of worsening QoL outcome with decreasing BMI, serum albumin, cholesterol and haemoglobin (Table II). These are markers of nutritional status, which can influence QoL. A number of studies have shown that both haemoglobin [5, 9, 10] and albumin [5, 9, 11-13] correlated well with QoL. However, a study using the SF-36 QoL questionnaire [9], showed that the level of cholesterol was not related to the QoL score.

Diastolic blood pressure of greater than 90mmHg (Table II) conferred a reduction of 31% probability in achieving a better QoL scores compared to 70-90mmHg. This may indicate underlying poorly controlled blood pressure with its associated end organ damage and adverse effects of polypharmacy which can lower QoL.

iPTH levels (Table II) of 100-250 ng/L was associated with a 34% increased chance of a better QoL outcome compared to those of <100 ng/L. Those with >250 ng/L did not show significant advantage presumably due to the associated bone pain in high bone turnover state. Other authors did not find correlation between iPTH and QoL [9].

The measure of dialysis adequacy Kt/V did not have an impact on QoL scores among HD patients (Table II). Moreno *et al*[17], Morton *et al*[20] and Kalantar-Zadeh *et al*[9] all reported similar findings. Spitzer's QoL total score has been reported to be skewed to the right, indicating poor discrimination among well outpatient HD patients [18], especially those with Kt/V >1.2. In addition, in this report those with a Kt/V<1 (n= 331) involved a relatively small number of patients compared to the other subgroups (n >900). Such biases may have confounded the impact of Kt/V. Whether Asian haemodialysis patients tolerate a lower threshold of Kt/V remains uncertain and will need further investigations.

Spizter's QoL scoring system was developed for the use in patients with cancer and other chronic diseases. It was designed to be administered by a doctor or other health professionals as translating the instrument into Chinese and Tamil language was beyond the means of the NRR [55]. Being a generic instrument, it may not have focused adequately on an area of interest or particular clinical problem compared to the disease specific QoL questionnaire e.g. Kidney Disease Questionnaire [21], KDQOL-SF Questionnaire [22] and DIA QOL [11]. These instruments are reliable and valid, as shown in different trials [1, 11, 23, 24]. The majority of our local patients are not literate and therefore were unable to comply with these self-administered instruments.

Conclusion

Amongst dialysis patients the QoL outcome is positively influenced by various factors including male gender, younger age, starting dialysis in 2001-2002, CAPD, BMI>25, albumin of at least 30 g/L, serum cholesterol of >3.2 mmol/L, haemoglobin at least >10 g/dL, and an iPTH of 100-250 ng/L. Diabetes which was present in 40% of our patients has a negative influence on QoL. Similarly HD, the modality used by at least 90% of our dialysis population, exerts a negative impact. In a resource intensive treatment such as dialysis, optimal rehabilitation of the patient becomes important from many perspectives. Competing demands for limited resources will force funding authorities to look beyond patient survival and a successful rehabilitation program will stand dialysis in good stead. It is important also from the patient's viewpoint. A long term repetitive treatment schedule undoubtedly affects the psychosocial well being of the patients. Further research to ascertain and minimize the impact of these risk factors on QoL can lead to the development of strategies that will promote optimal rehabilitation.

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