

HEALTH-RELATED QUALITY OF END-STAGE RENAL DISEASE PATIENTS UNDERGOING RENAL REPLACEMENT THERAPY

Mohammed M. Alhaji¹, Hon K. Yee¹, Sartaj Alam², Mohammad Hossain¹, Asrar Khan³, Jackson Tan²

ABSTRACT

Objectives: This preliminary study set out to assess and compare the health-related quality of life (HRQOL) of ESRD patients undergoing renal replacement therapy (RRT) in Brunei Darussalam.

Methods: A total of 124 ESRD patients (60 on hemodialysis, HD; 35 on peritoneal dialysis, PD; and 29 on kidney transplantation, KT), randomly selected, self-administered the World Health Organization Quality of Life (WHOQOL-BREF) questionnaire.

Result: The mean age of the sample was 49.8 years (SD 1.23) and the majority (53.2%) were male. KT patients had the highest mean score in all the four WHOQOL-BREF domains (physical health, psychological health, social relationship and environment) compared to patients undergoing either HD or PD patients ($P < 0.001$) and a similar score in one domain (environment) with PD patients. PD patients had higher mean scores than the HD patients in all the domains but similar mean score in one domain (physical health). Overall, KT patients had the best HRQOL followed by PD and HD patients in Brunei Darussalam.

Conclusion: This study has confirmed the superiority of KT over dialysis, and PD over HD in terms of HRQOL measured with WHOQOL-BREF.

Keywords: HQOL, RRT, Dialysis, Kidney transplantation, CKD, ESRD, PROM

INTRODUCTION

In 2010, over 2.6 million received renal replacement therapy (RRT) worldwide and more than 2 million people died due to lack of access to RRT.¹ The RRT usage in Asia is projected to increase from about 1 million in 2010 to 2.1 million by 2030, putting Asia in the top chart of RRT users.¹ While the incidence and prevalence of ESRD seem to have stabilized in developed countries due to decrease or stability in the risk factors (e.g. hypertension, diabetes mellitus),² coupled with an understanding of how progress in the care of ESRD patients is most appropriately measured and monitored. For many affluent countries, incident ESRD rates have stabilized since about the middle of the last decade. For example, the number of new cases in the USA has remained stable at approximately 110,000 per year during this period, while in Japan, growth in annual incident counts appears to have stabilized as of 2012. However, incidence rates rose for many developing countries. An immense "renal replacement therapy (RRT

the reverse is almost the case in developing countries.^{1,3}

Brunei Darussalam, with its modest population (417,200 in 2016), has seen an astronomical increase of ESRD patients in the last two decades. In 2011, the incidence and prevalence of ESRD in Brunei were estimated at 265 and 1250 per million population (ppm), respectively.⁴ Medical history, ESRD etiological causes, laboratory investigations, dialysis treatment and outcomes. There were 545 prevalent RRT patients in Brunei at the end of 2011. The incidence and prevalence of ESRD were 265 and 1250 per million population. Hemodialysis (HD) is the most obvious burden associated with ESRD is the financial cost it comes with. Developed countries spend as much as 3% of their annual health budget on ESRD patients who constitute about 0.03% of patients' populations.⁵ For example, the financial cost of CKD and ESRD in England is more than the cost of cancers of breast, colon, lung and skin combined.⁶ In Brunei Darussalam, health care services including RRT services are provided free of charges to citizens and permanent residents.⁴ Medical history, ESRD etiological causes, laboratory investigations, dialysis treatment and outcomes. There were 545 prevalent RRT patients in Brunei at the end of 2011. The incidence and prevalence of ESRD were 265 and 1250 per million population. Hemodialysis (HD) consequently, the Brunei Dialysis and Transplant Registry (BDTR) was established in 2011 to collect among other objectives study the HRQOL from the ESRD patients.⁴ Medical history, ESRD etiological causes, laboratory investigations, dialysis treatment and outcomes. There were 545 prevalent RRT patients in Brunei at the end of 2011. The incidence and prevalence

¹ Institute of Health Sciences, Universiti Brunei Darussalam, Gadong BE1410, Brunei Darussalam

² RIPAS Hospital, Bandar Seri Begawan BA1710 Brunei Darussalam

³ School of Medicine, University of Wollongong, Australia

Address for correspondence:

Dr. Sartaj Alam

RIPAS Hospital, Bandar Seri Begawan BA1710 Brunei Darussalam

Email: drsartajalam@hotmail.com

Cell No.0315-9740848

of ESRD were 265 and 1250 per million population. Hemodialysis (HDESRD impairs HRQOL of the patients.⁷

HRQL, a broad concept of subjective perception of one's health status as a convenient patient-reported-outcome measure (PROM).⁸ Measured by the use of easily-administrable, non-invasive, validated generic or disease-specific tools, HRQOL has become an important variable in predicting health outcomes in ESRD patients.⁹ Though not a replacement for the customary clinical prognosis, HRQOL assessments offer a major shift in the patient's perception of their well-being.¹⁰ Studies have also shown that patients who had received a kidney transplant have better HRQOL, live longer compared to patients receiving dialysis, and PD patients have better QoL than HD patients.^{11,12} A meta-analysis review study, however, reported that the differences in QoL between HD and PD are not significantly different.¹³

No study had previously investigated and compared the HRQOL of patients undergoing RRT in Brunei Darussalam. Therefore, this preliminary study was carried out to preliminarily explore the HRQOL in ESRD undergoing RRT modalities as an exploratory study toward building robust local evidence needed to support the emerging nephrology policy direction in the country.

METHODS

Study Design, Participants and Setting

This was a cross-sectional study conducted between January 2016 and March 2016 on a sample of 124 ESRD outpatients (60 HD, 36 PD & 29 KT) randomly enrolled at the various renal clinics in Brunei Darussalam. The sample size represented about 23% of the total ESRD population in Brunei Darussalam in 2011.⁴ Medical history, ESRD etiological causes, laboratory investigations, dialysis treatment and outcomes. There were 545 prevalent RRT patients in Brunei at the end of 2011. The incidence and prevalence of ESRD were 265 and 1250 per million population. Hemodialysis (HDESRD patients younger than 18 years, those with severe physical impairment, and those who were not on either HD, PD or KT were excluded in this study. The majority of the patients met dialysis (72%), nutritional (75%) and haemoglobin (77%) targets thereby minimizing bias from severe 'ill-health'.

QoL Measurement

Willing patients self-administered the World Health Organization Quality of Life (WHOQOL-BREF) questionnaire (Malay version) under supervision and assistance from the nurses. The 24-Item WHOQOL-BREF questionnaires were scored and converted to 0-100 scale, with 0 signifying worse, and 100 shows best HRQOL scores.

Statistical Analysis

Data were analysed using the Statistical Package for the Social Science (SPSS) Version 15.0. Descriptive statistics were depicted using mean, median, and percentage (%) with their corresponding measure of dispersions. One-way ANOVA tests (and Kruskal Wallis test in the case of the non-parametric test) were used to test for statistical difference between comparable groups. All statistical difference at $P < 0.05$ were considered significant.

Ethical Considerations

Sufficient participation information was communicated and written consent was obtained from the patients. The questionnaire was administered confidentially while they were being dialysed, or after clinical consultations for the KT patients. This study protocol was approved by the Medical and Health Research Ethics Committee (MHREC), Ministry of Health Brunei Darussalam.

RESULTS

Patients' Profile

The mean age of the study participants ($N=124$) was 49.8 ± 1.23 years. 48.4% ($n=60$) of the participants were receiving HD while 28.2% ($n=35$) was receiving

Table 1: Demographic characteristics of 124 respondents

Variables	n (%)	Mean (SD)
Age (Years) RRT Modality		49.8 (1.23)
KT	29 (23.4)	
PD	35 (28.2)	
HD	60 (48.4)	
Gender		
Male	66 (53.2)	
Female	58 (46.8)	
Ethnicity		
Malay	93 (75.0)	
Others*	31 (25.0)	
Marital status		
Married	100 (80.6)	
Single	24 (19.4)	
Employment status		
Employed	45 (36.3)	
Unemployed	79 (63.7)	

SD=Standard Deviation; *includes Chinese, Dusun, Iban

Table 2: Physical and Psychological Health Domain Score According to RRT Modality

RRT Modality	N	Physical Health Median (IQR)	P value ^a	Psychological Health Mean (SD)	P value ^c
KT	29	63.0 (6.0)	<0.001 ^b	60.8 (13.3)	<0.001 ^b
PD	35	56.0 (19.0)		59.9 (13.7)	
HD	60	56.0 (25.0)		49.9 (15.2)	

^aKruskalWalis Test; ^bPost-hoc test (Scheffe's procedure); ^cOne-Way ANOVA

Table 3: Social Relationship ad Environment Domain Score According to RRT Modality

RRT Modality	n	Social Relationship Mean (SD)	P value ^c	Environment Mean (SD)	P value ^c
KT	29	75.5 (17.9)	<0.001	72.8 (14.7)	<0.001 ^b
PD	35	62.1 (17.3)		72.9 (16.4)	
HD	60	49.6 (19.6)		63.8 (18.3)	

^aKruskalWalis Test; ^bPost-hoc test (Scheffe's procedure); ^cOne-Way ANOVA

PD and 23.4% (n=29) had kidney transplant. The participants were 53.2% (n=66) male and 46.8% (n=58) female. Ethnic-wise, 75% (n=93) of the respondent was Malay whereas 25% comprised of other ethnic/race group including Chinese, Dusun and Iban. Majority (80.6%, n=100) were married compared to 19.4% (n=24) who was not. 63.7% (n=79) of the patients were not employed compared to 36.3% (n=45) who were in the employment at the time of this study. Table 1.

QOL Scores according to RRT Modality

The average mean scores of all domains of QoL in WHOQOL were above average for all the RRT modality with the exception of patients on HD whose average mean score was 49.6 (SD: 19.6) for the social relationship domain. For physical health, patients on KT median score was 63.0 (IQR: 6.0), higher than both PT and HD with 56.0 each. Patients on PT showed comparable median score in physical health domain with patients on HD (56.0 vs 56.0). Post-hoc test showed that the physical health of patients receiving KT was significantly higher than either of HD or PD (P<0.001). KT patients also have better mean score (60.8; SD: 13.3) of psychological health than PT with 59.9 (SD: 13.7) and HD with 49.9 (SD: 15.2), and the difference was statistically different (P<0.001). Table 2.

The scores for the social relationship and environment domains were generally higher than the scores for physical health and psychological scores for all the three RRT modalities. Nevertheless, the mean score (72.8) in environment domain for KT is similar to that of PD (72.9) and were both higher than HD average score in the same domain (63.8). The difference between HD and KT score on one hand and HD, on the other hand, was also statistically significant (P<0.001). Table 3.

Lastly, the gap in scores between the three modalities was widest in the social relationship QoL domain. KT patients had better mean score (75.5) by more than a quarter than HD patients, and the difference was statistically different between KT patients on one hand; PD (62.1) and HD (49.6) on the other (P<0.001). Table 3.

DISCUSSION

The results on KT having better QoL than either HD or PD; and PD having better QoL than HD reported in this study is not very different from those reported in previous studies in China,¹⁴ and the United States.¹⁵ Although some studies have reported conflicting results on which dialysis modality (PD or HD) offers better HRQOL, studies were largely unanimous in submitting that KT patients tend to have better HRQOL,¹² better survival and low mortality.¹⁶ UK (UK Renal Registry Example, a meta-analysis review study on 36,582 patients reported that the differences in QoL between HD and PD are not significantly different.¹³ Another systematic review of 26 observational studies reported that there is no definitive 'yes' or 'no' answer to the question of which dialysis modality (HD or PD) offers better QoL.¹⁷

However, the use of different tools such as KDQOL, MOS SF-36¹⁸ health care researchers have demonstrated that the concept of QoL relates to a deeper meaning of an individual's experience of life and health.
DESIGN: Walker and Avant's (2010 to assess QoL in ESRD population makes a comparison between studies difficult.¹⁷ For example while WHOQOL-BREF has only 24 items to access four domains of health (physical, psychological, social relationship and environment),¹⁹ SF-36 has 36 items to assess to QoL in 8 domains (general health, body pain, social

functioning, emotional well-being, role limitations as a result of emotional problem, role limitations as a result of physical health, energy and fatigue, and physical function).²⁰

Interestingly, although KT offers better HRQOL and is more cost-effective than HD and PD; it remains the least subscribed RRT modality worldwide.¹ Countries like Thailand and Hong Kong have also prioritized the PD over HD.²¹

This preliminary study supports the fledgeling local transplant program and the proposed policy of PD over HD preference policy in Brunei Darussalam. Likewise, public awareness programmes were floated to inform the masses on the scourge of CKD and RRT modalities. A recent survey carried out on a randomly selected 300 person revealed that 78.7% were willing to donate a kidney to their loved ones when needed, and 59.7% would prefer local kidney transplantation.²² Finally, although this study is only a preliminary study, it's the first HRQOL study carried out in ESRD patients in Brunei Darussalam.

LIMITATIONS

This study is not an extensive one, as it only looked at the 'crude' difference between RRT modalities, therefore its generalisability is limited. It did not assess the interacting effects of other variables such as haemoglobin level and comorbidities that have been shown to influence QoL in ESRD patients.²³ Less is known about the relationship between CKD and HRQOL. This article reviews the recent evidence on HRQOL, its correlates and proposed intervention strategies to improve HRQOL in CKD. RECENT FINDINGS A growing body of literature indicates that various comorbid conditions related to CKD play a substantial role in impaired HRQOL in CKD. Hypertension, both a cause and complication of CKD, negatively affects HRQOL due to associated comorbidities, side effects from antihypertensive medications and awareness of the diagnosis. Anemia has been associated with HRQOL, but concerns about the safety of erythropoietin-stimulating agents (ESAs). Indeed, this was only conducted only as a preliminary study to herald the planning of much more specialised studies to inform nephrology-related practices and policies in the country.

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