

Quality of life before and after commencing peritoneal dialysis in Hong Kong elderly

SH Lo BSc (Nursing), MSc (Clinical Gerontology), BC Tong MBBS (HK), FHKCP, FHKAM (Med), FRCP (Glasg and Edin)

ABSTRACT

Background. Quality of life (QoL) is an important outcome measure, especially for patients with chronic disease. Patients with end-stage renal failure require renal replacement therapy including peritoneal dialysis (PD). Compared to the younger patients, the elderly patients may have more difficulties in dealing with PD. This study aimed to assess the change in QoL in elderly patients following PD, and to determine the predictors of QoL change.

Methods. 31 elderly patients (≥ 60 years of age) on PD were recruited. Their QoL before and 3 months after initiation of PD treatment was measured using the Kidney Disease Quality of Life Short Form questionnaire. Patient demographics, physical and mental health status, and QoL score were collected for analysis.

Results. The QoL score increased significantly after initiation of PD ($p < 0.001$), as did that for the general health perception ($p = 0.045$), role limitations-emotional ($p = 0.018$), social functioning ($p < 0.001$), symptom list ($p = 0.008$), overall health rating ($p = 0.002$), and overall health rating compared with 1 year earlier ($p < 0.001$). Predictors for QoL increase were age ($p = 0.014$), religion ($p = 0.001$), and ability to independently perform PD ($p = 0.036$).

Conclusions. The QoL of elderly patients with end-stage renal failure improved significantly 3 months after commencement of PD. Improvement also occurred in general health perception, role limitation by emotional disturbance, disease-related symptoms, social functioning, and overall health rating. Predictors for QoL improvement included age, presence of a religious belief, and having a helper.

Department of Medicine and Geriatrics,
Princess Margaret Hospital, Hong Kong

Correspondence to: Suet Hang Lo,
Department of Medicine and Geriatrics,
Princess Margaret Hospital, 2-10 Princess
Margaret Hospital Road, Lai Chi Kok,
Kowloon, Hong Kong. Email:
lo.suethang@gmail.com

BACKGROUND

Patients with end-stage renal failure require renal replacement therapy in the form of peritoneal dialysis (PD), haemodialysis, or kidney transplantation. Unless there is a chance of kidney transplantation, such patients have to undergo lifelong PD or haemodialysis. The number of such patients has increased in most developed countries.¹ PD includes continuous ambulatory PD, autonomic PD, and continuous cycling PD. It can be performed by the patient or helper at home after training. PD aims to

maintain an optimal fluid and electrolyte balance by removing excess fluid and metabolic waste products such as creatinine and urea.

PD is a safe treatment for many frail elderly patients.¹ Compared with younger patients, the elderly patients have decreased mental and physical function and psychosocial adaptation.² The need for dialysis is associated with a substantial decline in function.³ The elderly patients may have more difficulties in dealing with PD. The prevalence of psychological symptoms is high in Chinese PD

patients, and depressive symptoms are common in elderly male patients.⁴ There is a strong correlation between PD and both physical and psychological factors, especially in the elderly.

According to the World Health Organization, quality of life (QoL) is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards, and concerns.⁵ Chronic diseases can alter a patient's life and negatively affect their physical, psychological, mental, social, and spiritual aspects of health.⁶ QoL can influence the morbidity and mortality in patients with end-stage renal failure on dialysis.⁶ It is therefore crucial to understand the QoL of patients on PD and the associated factors.

Compared with patients in the USA, Hong Kong Chinese on continuous ambulatory PD have lower QoL, including dissatisfaction with health and functioning, family, psychological and spiritual, and socioeconomic aspects.⁷ Underlying causes may include the irreversible nature of the disease and need for chronic therapy with consequent exhaustion of patients and helpers.

The increasing number of older adults with chronic conditions is challenging to health care professionals and the health care system.⁸ Deterioration in the health of elderly patients during the course of dialysis can lead to withdrawal, non-compliance, and failure of treatment. Advanced age is associated with poor outcome in dialysis patients; age is the only factor that determines morbidity and mortality in the PD patient.⁹ This study aimed to assess the change in QoL in elderly patients following PD, and to determine the predictors of QoL change.

SUBJECTS AND METHODS

This prospective cohort study was approved by the Cluster Research Ethics Committee of Hong Kong Hospital Authority. It was conducted from October 2014 to July 2015 in the renal centre of Princess Margaret Hospital in Hong Kong, China. Written informed consent was obtained from each patient. A before-after research design was used to measure the dependent variable before and after initiation of PD.

Elderly patients aged ≥ 60 years who were prescribed out-patient PD were included. Convenient sampling was used. Those who could not communicate or had cognitive disease (such as dementia) were excluded.

Demographic data including age, gender, marital status, educational level, working status, monthly income, religion, and chronic disease were collected. Patients completed a self-report Kidney Disease Quality of Life Short Form questionnaire^{10,11} before and 3 months after initiation of PD treatment. Patients who were unable to read or write were interviewed.

The questionnaire has been validated in the Hong Kong Chinese population and kidney disease patients undergoing dialysis.^{12,13} It includes categorical and Likert-scale items. Total score range is 0 to 100; a higher score indicates better QoL. It comprises a total of 80 items: 36 generic core items, 43 kidney-disease-targeted items, and an overall health rating item. The 36 generic core items measure physical and mental health status: physical functioning (10 items), role limitations due to physical health (4 items), bodily pain (2 items), general health perception (5 items), emotional well-being (5 items), role limitations due to emotion (3 items), social functioning (2 items), energy/fatigue (4 items), and overall health (1 item). In addition, particular health-related concerns in patients with kidney disease and on dialysis are included: symptom/problem (12 items), effects of kidney disease on daily life (8 items), burden of kidney disease (4 items), work status (2 items), cognitive function (3 items), quality of social interaction (3 items), sexual function (2 items), and sleep (4 items). It also includes QoL measures: social support (2 items), dialysis staff encouragement (2 items), and patient satisfaction (1 item).

The paired-sample *t* test was used to compare QoL before and after PD treatment. The effect of various factors on QoL change was estimated using linear regression. A *p* value of <0.05 was considered statistically significant.

RESULTS

33 subjects were recruited, and 33 and 31 questionnaires were completed before and 3 months after initiation of PD, respectively. The rejection rate

was 0%. The study population comprised 18 men and 13 women aged 60 to 79 (mean±SD, 67.13±5.04) years (TABLE 1).

TABLE 1
Patient characteristics*

Variables	Value
Sex (M:F)	18:13
Age (years)	67.13±5.04
Marital status	
Married	23 (74.2)
Divorced	1 (3.2)
Widowed	7 (22.6)
Educational level	
No formal education	5 (16.1)
Primary or below	11 (35.5)
Secondary	8 (25.8)
Secondary graduated	6 (19.4)
Tertiary	1 (3.2)
Working status	
Full time work	4 (12.9)
Retired	27 (87.1)
Monthly income (HK\$)	
No income	2 (6.5)
1-5000	15 (48.4)
5001-10000	9 (29)
10001-15000	1 (3.2)
≥\$20001	2 (6.5)
Religion	
No religion	25 (80.6)
Buddhism	3 (9.7)
Catholic	2 (6.5)
Christian	1 (3.2)
Other chronic diseases	
Yes	30 (96.8)
No	1 (3.2)
Type of peritoneal dialysis	
Continuous ambulatory peritoneal dialysis	26 (83.9)
Autonomic peritoneal dialysis	5 (16.1)
Peritoneal dialysis independency	
Self	25 (80.6)
Helper	6 (19.4)
Hospitalisation after therapy	
Yes	5 (16.1)
No	26 (83.9)

* Data are presented as mean±SD or no. (%) of patients

Variables that improved significantly after PD treatment included QoL score (66.35±11.34 vs. 73.17±10.74, $p<0.001$), general health perception (44.52±20.43 vs. 54.52±20.01, $p=0.045$), role limitation-emotional (76.34±40.55 vs. 93.55±15.91, $p=0.018$), social functioning (73.79±23.79 vs. 90.23±15.80, $p<0.001$), symptom list (81.12±10.47 vs. 86.90±8.89, $p=0.008$), overall health rating (59.03±18.50 vs. 69.35±13.89, $p=0.002$), and overall health rating compared with 1 year earlier (21.77±27.94 vs. 54.84±28.44, $p<0.001$) [TABLE 2].

Higher QoL score was associated with older age ($r=0.565$, 95% confidence interval [CI]=0.121-1.009, $p=0.014$), having a religious belief ($r=9.094$, 95% CI=3.956-14.231, $p=0.001$), and availability of a helper to perform PD ($r=6.166$, 95% CI=0.436-11.897, $p=0.036$) [TABLE 3].

DISCUSSION

Improvement in QoL after PD treatment

In this study, QoL of the elderly patients improved significantly after PD treatment. QoL is a predictor of mortality and hospitalisation, and a lower score is associated with higher risk of death and hospitalisation in dialysis patients.¹⁴ Therefore it is important to prevent worsening of QoL in such patients. A 2-year study revealed that QoL declined over time in patients on PD, but the study was not specific to the elderly or the Hong Kong population.¹⁵ The long-term outcome of PD in the elderly is unknown. Patients on dialysis may go through 3 stages.^{16,17} The first stage is the 'honeymoon period' characterised by an improved physical well-being. The second stage is the 'disenchantment and discouragement period' characterised by sadness and denial, and feelings of hopelessness and helplessness. The third stage is the 'long-term adaptation' when the patient achieves some level of acceptance of his/her disease and its limitations.

In our patients, the general health perception improved after PD treatment. Subjective health perception and physical complaints influence the frequency of medical consultations and health care utilisation.¹⁸ Attention should be paid to the healthy elderly with a poor self-perception of health, because they are more depressed, hypochondriacal, and dissatisfied with life.¹⁹

TABLE 2
Quality of life before and after peritoneal dialysis

Variables	Mean±SD score		p value
	Baseline	3 months	
Quality of life score	66.35±11.34	73.17±10.74	<0.001
Physical functioning	71.61±18.46	74.84±17.96	0.108
Role limitations – physical	70.97±42.38	82.26±28.28	0.08
Pain	85.81±22.07	91.30±17.98	0.174
General health perceptions	44.52±20.43	54.52±20.01	0.045
Emotional well-being	76.52±20.68	81.42±17.82	0.078
Role limitations – emotional	76.34±40.55	93.55±15.91	0.018
Social functioning	73.79±23.79	90.23±15.80	<0.001
Energy/fatigue	60.32±28.31	67.58±23.48	0.179
Symptom list	81.12±10.47	86.90±8.89	0.008
Effects of kidney disease	59.48±16.93	61.29±16.61	0.509
Burden of kidney disease	39.31±21.05	46.37±24.62	0.122
Work status	17.74±27.53	14.52±26.44	0.536
Cognitive function	81.72±18.13	85.38±18.09	0.185
Quality of social interaction	78.71±24.25	85.60±18.63	0.072
Sex	5.65±22.09	14.52±34.63	0.227
Sleep	58.15±23.20	63.06±21.09	0.224
Social support	67.74±20.16	75.82±20.11	0.062
Dialysis staff encouragement	63.71±16.25	71.37±13.85	0.105
Patient satisfaction	78.50±16.77	84.95±13.85	0.056
Overall health rating	59.03±18.50	69.35±13.89	0.002
Overall health rating compared to 1 year earlier	21.77±27.94	54.84±28.44	<0.001

TABLE 3
Predictors of quality of life

Predictors	Coefficients (95% CI)	p value
Age	0.565 (0.121, 1.009)	0.014
Sex	-0.820 (-5.766, 4.127)	0.737
Marital status	1.832 (-3.714, 7.378)	0.505
Educational level		
Primary	-2.944 (-10.322, 4.435)	0.421
Secondary or above	-2.977 (-10.041, 4.088)	0.395
Working status	0.231 (-3.415, 3.878)	0.898
Monthly income (HK\$)		
1-10000	-7.432 (-17.230, 2.370)	0.132
≥10001	-6.515 (-17.656, 4.626)	0.241
Religion	9.094 (3.956, 14.231)	0.001
Other chronic diseases	10.022 (-3.287, 23.331)	0.134
Type of peritoneal dialysis	1.394 (-5.235, 8.022)	0.67
Independence in peritoneal dialysis	6.166 (0.436- 11.897)	0.036
Hospitalisation after therapy	-0.721 (-7.365, 5.923)	0.826

In our patients, role limitation by emotional disturbance reduced after PD treatment. Elderly patients often show better psychosocial adjustment to dialysis than younger patients; nonetheless physical limitations increase with age.²⁰ The elderly can adapt to such new therapy with no disturbance to their daily activities. Nonetheless, since PD is a long-term therapy, it is important to focus on the progressive degeneration in physical functioning that occurs with ageing.

In our patients, disease-related symptoms improved after PD treatment. PD can maintain an optimal fluid and electrolyte level, remove excess metabolic waste products (such as creatinine and urea), and relieve the symptoms of kidney disease (such as low appetite, tiredness, uraemic symptoms, itchy skin and shortness of breath). PD occupies patients' time. Yet, social function of our patients improved after PD treatment, possibly due to relief of end stage renal failure symptoms. Improved physical health permits increased social interaction, which is an important component of QoL in the elderly.²¹ Overall health rating was also improved after PD treatment and compared with one year earlier.

Predictors for QoL improvement

Age

The QoL of PD patients is negatively related to age.⁶ Nonetheless, in our study, patients aged ≥ 60 years were associated with improvement in QoL. This finding is supported by another study that age is one of the main predictors of QoL.²² In comparison of older (age ≥ 60 years) and younger people with end-stage renal failure, the elderly have less stress and a better perception of QoL.²³ Another study also indicated superior QoL in elderly PD patients than their younger counterparts.²⁴ Elderly patients often show better psychosocial adjustment to dialysis.²⁵ Older patients report lower physical functioning but higher mental health scores than younger patients after 2 months of chronic dialysis.²⁰ Advanced age positively associated with life satisfaction among patients on PD. The elderly perceived life to be less stressful. They may have fewer unfulfilled aspirations and are thus more willing and able to adapt to the difficulties associated with end-stage renal failure and PD.²⁰ The higher QoL in the elderly may be because the treatment has less impact on life, compared with younger patients who are likely to be

more occupationally and socially active.²⁴

Older patients on PD also feel more satisfied with their life and more readily accepted limitations.²⁶ They are happy to be alive and enjoy life despite their chronic illness.²³ The elderly may also have lower expectations of treatment. All of these factors positively impact QoL in the elderly and is consistent with the result of another study wherein elderly PD patients had a higher well-being index, more positive feelings, fewer negative feelings, and a feeling that their lives were easier when compared with younger patients.²⁰

Age alone should not be used as a barrier to referral and treatment. There is a need to consider the benefits of dialysis in elderly people. In a study of 2 closely matched demographic groups of older dialysis patients, QoL was better in those on PD than haemodialysis, and thus PD was recommended to all suitable older people.²⁷ It is also important to ensure all patients benefit from treatment. Age should not affect selection for treatment; access to care should be equal for all.

Religion

The QoL score of the elderly was higher in those with a religious belief than those without. When people are physically ill, they rely heavily on religious beliefs and practices to relieve stress and maintain hope. Religion may enable patients to better cope with negative health experience, especially a disabling medical illness.²⁸ Thus possession of a religious belief may improve QoL in patients on life-long PD.

Independence in peritoneal dialysis

The availability of a helper to perform PD was associated with superior QoL for the elderly compared with no helper. Dependence on a carer increases with increasing co-morbidity. A cohort study showed that QoL score improved after 1 year for both patients on PD and their carers.²⁹ Despite increasing the burden on caregivers, QoL of the patients improved, especially in social functioning. Thus if elderly patients are unable to perform their own PD, help from a carer should be provided when possible.

Limitations

This study was limited by the short period of time.

QoL was measured after 3 months of PD during the 'honeymoon period'. Results thus represent the short-term effect of PD. A longitudinal study is recommended to assess QoL after different periods of time on PD. This study also lacked a control group, and change in QoL may have been due to factors other than the effects of PD. Nonetheless to allocate patients in need of PD as controls would have been unethical.

CONCLUSION

The QoL of elderly patients with end-stage renal failure improved significantly 3 months after commencement of PD. Improvement also occurred in general health perception, role limitation by emotional disturbance, disease-related symptoms, social functioning, and overall health rating. Predictors for QoL improvement included age, presence of a religious belief, and having a helper.

ACKNOWLEDGEMENTS

The authors would like to thank the participants at Princess Margaret Hospital.

REFERENCES

- Dimkovic N, Oreopoulos DG. Assisted peritoneal dialysis as a method of choice for elderly with end-stage renal disease. *Int Urol Nephrol* 2008;40:1143-50.
- Bowman GS, Martin CR. Evidence of life quality in CAPD patients and implications for nursing care: a systemic review. *Clin Eff Nurs* 1999;3:112-23.
- Kurella Tamura M, Covinsky KE, Chertow GM, Yaffe K, Landefeld CS, McCulloch CE. Functional status of elderly adults before and after initiation of dialysis. *N Engl J Med* 2009;361:1539-47.
- Lai KY, Chan HS, Leung VK, et al. Prevalence of psychological problems in Chinese peritoneal dialysis patients. *Hong Kong J Nephrol* 2005;7:82-9.
- World Health Organization. *Scoring and coding for the WHOQoL SRPB field-test instrument*. Available at: http://apps.who.int/iris/bitstream/10665/77778/1/WHO_MSD_MER_Rev.2012.05_eng.pdf. Accessed 29 March 2015.
- Al Wakeel J, Bayoumi M, Al Suwaida A, et al. Influences on quality of life in peritoneal dialysis patients. *Renal Soc Australas J* 2009;5:127-32.
- Ching SY, Pun OM, Wong KS, Chan LK. Quality of life of continuous ambulatory peritoneal dialysis (CAPD) patients. *Hong Kong J Nephrol* 2000;2:98-103.
- Foret Giddens J, Tanner E, Frey K, Reider L, Boulton C. Expanding the gerontological nursing role in Guided Care. *Geriatr Nurs* 2009;30:358-64.
- Sezto CC, Wong TY, Leung CB, et al. Age itself is not a prognostic indicator of poor outcome in elderly Chinese patients treated with continuous ambulatory peritoneal dialysis (CAPD). *Hong Kong J Nephrol* 1999;1:23-9.
- Hays RD, Kallich JD, Mapes DL, Coons SJ, Carter WB. Development of the kidney disease quality of life (KDQOL) instrument. *Qual Life Res* 1994;3:329-38.
- RAND. *Kidney Disease Quality of Life Short Form (KDQOL-SF™), Version 1.3: a manual for use and scoring*. 1997. Available at: <http://www.rand.org/content/dam/rand/pubs/papers/2006/P7994.pdf>. Accessed 1 March 2014.
- The Hong Kong Polytechnic University. *Development of the Hong Kong Chinese version of the kidney disease quality of life short form (KDQOL-SF)*. 1999. Available at: <http://theses.lib.polyu.edu.hk/handle/200/3467>. Accessed 1 March 2014.
- Chow KM, Szeto CC, Kum LC, et al. Improved health-related quality of life and left ventricular hypertrophy among dialysis patients treated with parathyroidectomy. *J Nephrol* 2003;16:878-85.
- Mapes DL, Lopes AA, Satayathum S, et al. Health-related quality of life as a predictor of mortality and hospitalization: the Dialysis Outcomes and Practice Patterns Study (DOPPS). *Kidney Int* 2003;64:339-49.
- Bakewell AB, Higgins RM, Edmunds ME. Quality of life in peritoneal dialysis patients: decline over time and association with clinical outcomes. *Kidney Int* 2002;61:239-48.
- Suet-Ching WL. The quality of life for Hong Kong dialysis patients. *J Adv Nurs* 2001;35:218-27.
- Suet-Ching WL. The psychometric properties of the Chinese Dialysis Quality of Life Scale for Hong Kong dialysis patients. *J Adv Nurs* 2001;36:441-9.
- Schneider G, Driesch G, Kruse A, Wachter A, Nehen HG, Heuft G. What influences self-perception of health in the elderly? The role of objective health condition, subjective well-being and sense of coherence. *Arch Gerontol Geriatr* 2004;39:227-37.
- Blazer DG 2nd, Houpt JL. Perception of poor health in the healthy older adult. *J Am Geriatr Soc* 1979;27:330-4.
- Kutner NG, Jassal SV. Quality of life and rehabilitation of elderly dialysis patients. *Semin Dial* 2002;15:107-12.
- Farquhar M. Elderly people's definitions of quality of life. *Soc Sci Med* 1995;41:1439-46.
- Bohlke M, Nunes DL, Marini SS, Kitamura C, Andrade M, Von-Gysel MP. Predictors of quality of life among patients on dialysis in southern Brazil. *Sao Paulo Med J* 2008;126:252-6.
- Apostolou T. Quality of life in the elderly patients on dialysis. *Int Urol Nephrol* 2007;39:679-83.
- Griva K, Yu Z, Chan S, et al. Age is not a contraindication to home-based dialysis: quality-of-life outcomes favour older patients on peritoneal dialysis regimes relative to younger patients. *J Adv Nurs* 2004;70:1902-14.
- Avramovic M, Stefanovic V. Health-related quality of life in different stages of renal failure. *Artif Organs* 2012;36:581-9.
- Valderrábano F, Jofre R, López-Gómez JM. Quality of life in end-stage renal disease patients. *Am J Kidney Dis* 2001;38:443-64.
- Brown EA, Johansson L, Farrington K, et al. Broadening Options for Long-term Dialysis in the Elderly (BOLDE): differences in quality of life on peritoneal dialysis compared to haemodialysis for older patients. *Nephrol Dial Transplant* 2010;25:3755-63.
- Koenig HG, Larson DB, Larson SS. Religion and coping with serious medical illness. *Ann Pharmacother* 2001;35:352-9.
- Fan SL, Sathick I, McKitty K, Punzalan S. Quality of life of caregivers and patients on peritoneal dialysis. *Nephrol Dial Transplant* 2008;23:1713-9.