Original Article

Supportive Management in Patients With End-stage Renal Disease: Local Experience in Hong Kong

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We report a retrospective observational study on supportive care services in a local renal center. Seventy-four patients who had opted for supportive management after renal replacement therapy assessments in 2008 were included in the study. They were older with more comorbidities than those who had opted for dialysis. Their reported symptoms on subsequent visits were recorded. Patients and their families had a realistic acceptance of death, as reflected by the high preference for do-not-resuscitate orders on their final admission. This demonstrates the importance of structured multidisciplinary renal replacement therapy assessment with advanced care planning in the management of patients with end-stage renal disease. [*Hong Kong J Nephrol* 2010;12(1):31–6]

Key words: end-stage renal disease, palliative care, renal replacement therapy assessment

以下是一項回溯性觀察性報告，主題是本地一所腎科中心的支持性照顧服務。納入分析者爲 74 位在 2008 年經過腎臟替代治療評估後選擇接受支援性治療的病人，相比於接受透析療法的患者，他們的年齡較高，亦有較多的並存疾病。在後續的複診中，醫護人員均對患者的症狀作出記錄。結果顯示，接受支持性照顧的病人及其家屬，對死亡的現實抱有高的接受度，他們之間有相當高的比例選擇在患者臨終病危時不進行復甦程序。這顯示在末期腎病患者的臨床處理中，有必要進行有組織的、多學科的腎臟替代治療評估，同時預先作出臨終照顧的規劃。

Introduction

The increasing incidence of end-stage renal disease (ESRD) is a global problem. Information from the United States Renal Data System show that the incidence and prevalence of ESRD is on a slow rising trend. ESRD prevalence grew most quickly among those aged ≥65 [1]. A significant proportion of them also suffered from diabetes mellitus with multiple vascular complications. Not all patients would benefit from dialytic therapy as it has been shown that patient survival is extremely poor in those with poor functional abilities at the commencement of dialysis [2]. It has also been demonstrated that patients with ESRD, poor functional status and extensive comorbidities do not live longer with dialysis when compared with those managed conservatively. In addition, such patients require frequent admissions for stabilization, and are more likely to die in hospital during these admissions [3]. A recent study has demonstrated substantial and sustained decline in functional status among nursing home residents after the start of dialysis, which may be related to underlying processes of aging with disabilities and coexisting conditions [4]. In-depth and repeated discussions on plans during renal replacement therapy (RRT) assessment are essential for making the best and most suitable choices for individual patients. With thorough discussion among different parties including patients, their families and

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clinical staff, patients may choose not to initiate dialysis. A recent survey found that 60.7% of patients receiving dialysis regretted the decision to start dialysis [5].

Our institution has a structured program of patient assessment for dialysis. All patients with chronic kidney disease [glomerular filtration rate (GFR) < 15 mL/min/1.73 m^2 for those with diabetes mellitus, or < 10 mL/min/1.73 m^2 for those without diabetes mellitus] are assessed by nephrologists and dedicated renal nurses, with multidimensional evaluation in terms of comorbid conditions, functional status, family condition, social support network, as well as financial situation. Patients attend a predialysis education program that is presented by different professionals, including nephrologists, renal nurses, dietitians, social workers, physiotherapists and patient group representatives. This helps to ensure adequate understanding and appropriate attitudes towards ESRD. Follow-up arrangements are made after individual assessments by renal nurses in the clinic. During the assessment, close family members are invited to join in the discussion on the long-term management plan. Their concerns about the disease process and anticipated difficulties are identified, any misconceptions clarified, and acceptance of the disease evaluated before any final decisions are made on RRT plans. Reassessments may be lengthy, and involve multiple sessions by nephrologists and/or renal nurses. Case review programs, involving social workers, dialysis staff and community nurses, are held regularly to discuss RRT plans in a holistic manner. For patients who opt for dialysis, dialysis access creation is arranged in a timely manner. Patients who opt for supportive management are followed in a designated clinic, namely the Renal Palliative Care Clinic, where they are under the care of nephrologists according to the main objectives of ensuring better control of disturbing uremic symptoms, more flexible follow-up appointments for drug titration as well as blood transfusion whenever necessary.

This retrospective review reports on the outcomes of incident patients with ESRD in 2008 who opted for supportive management, with a specific focus on symptom burden from advanced uremia and end-of-life care.

Patients and Methods

This was a retrospective observational study on consecutive new patients with ESRD who were referred for dialysis assessment between January 1, 2008 and December 31, 2008 in the Renal Unit of United Christian Hospital. The inclusion criterion was GFR < 15 mL/min/1.73 m^2 for patients with diabetes mellitus, or < 10 mL/min/1.73 m^2 for patients without diabetes mellitus, according to the Chinese version of the modified Modification of Diet in Renal Disease formula [6]. Exclusion criteria were: premature referral for RRT assessment due to higher GFR (non-diabetic patient with GFR > 10 mL/min/1.73 m^2 or diabetic patient with GFR > 15 mL/min/1.73 m^2); and the presence of a component of acute renal impairment. There was no limitation on age or comorbidities for patients to be eligible for study inclusion.

Baseline demographic data on age, sex, primary renal disease, coexisting medical conditions, Charlson Comorbidity Index, laboratory data, calculated GFR, and date of RRT assessment were recorded. In addition, the symptomatology reported by patients, without using questionnaires, on every clinic visit until December 31, 2009, were recorded by chart review. Causes of death were reviewed, with special attention paid to cardiopulmonary resuscitation (CPR) and do-not-resuscitate (DNR) orders, which reflected patients' and families' acceptance of the disease process and the quality of death.

Results were analyzed using NCSS 2004 (NCSS LLC, Kaysville, UT, USA) for PC. Student's *t* test for continuous data, and the χ^2 test or Fisher's exact test for categorical data were applied whenever appropriate. Kaplan-Meier curves were plotted for estimation of median survival for patients on supportive management.

Results

There were 225 new chronic kidney disease stage 5 patients referred for RRT assessment. Nine patients were considered to have been prematurely referred for assessment, and three patients were diagnosed to have acute-on-chronic renal failure; they were excluded from analysis. The remaining 213 patients were included in the study; the most common causes of chronic kidney disease in these patients were diabetic nephropathy and unknown etiology (Table 1). Seventy-four patients opted for supportive management, while the remaining 139 patients proceeded to dialysis. Only one patient was staying in a private old age home at the time of RRT assessment, and he opted for supportive management.

Table 1. Causes of end-stage renal disease

	Supportive management (n = 74)	Dialysis (n = 139)
Diabetic nephropathy	50	64
Chronic glomerulonephritis	1	23
Hypertensive nephropathy	2	2
Myeloma	1	1
Obstructive uropathy	1	5
Polycystic kidney disease	1	2
Rapidly progressive glomerulonephritis	1	0
Thrombotic microangiopathy	1	0
Renal malignancy	0	2
Systemic lupus nephritis	0	1
Etiology unknown	16	39

Table 2. Baseline characteristics of patients in the supportive management and dialysis groups

	Supportive management ($n=74$)	Dialysis ($n=139$)	Total ($n=213$)	p
Mean age (yr)	72.3	60.2	64.4	<0.001
Median age (yr)	73.8	62.4	66.4	
Male:Female (n)	26:48	55:84	81:132	0.526
Serum creatinine (μmol/L) (mean±SD)	667±303	769±305	734±307	0.005
eGFR (mL/min/1.73 m^2) at assessment (mean±SD)	10.71±6.77	8.76±4.02	9.43±5.21	0.004
CCI (mean±SD)	7.4±1.92	5.4±2.12	6.12±2.27	<0.001
Comorbid DM*	50 (67.57%)	70 (50.36%)	120 (56.34%)	0.016
History of MI*	18 (24.32%)	23 (16.55%)	41 (19.25%)	0.171
History of CHF*	21 (28.38%)	22 (15.83%)	43 (20.19%)	0.029
PVD*	6 (8.11%)	1 (0.72%)	7 (3.29%)	0.007
History of CVA*	26 (35.14%)	14 (10.07%)	40 (18.78%)	<0.001
Dementia*	1 (1.35%)	0 (0%)	0 (0%)	
Chronic pulmonary disease*	6 (8.11%)	6 (4.32%)	12 (5.63%)	0.253
Peptic ulcer disease*	9 (12.16%)	11 (7.91%)	20 (9.39%)	
Liver disease without portal hypertension*	1 (1.35%)	0 (0%)	1 (0.47%)	
Lymphoma*	2 (2.70%)	0 (0%)	2 (0.94%)	
Leukemia*	0 (0%)	0 (0%)	0 (0%)	
Metastatic tumor*	1 (1.35%)	0 (0%)	1 (0.47%)	
Connective tissue disease*	0 (0%)	1 (0.72%)	1 (0.47%)	
Severe liver disease*	0 (0%)	0 (0%)	0 (0%)	
AIDS*	0 (0%)	0 (0%)	0 (0%)	

*Percentage within group in parentheses. SD=standard deviation; eGFR=estimated glomerular filtration rate; CCI=Charlson Comorbidity Index; DM=diabetes mellitus; MI=myocardial infarction; CHF=congestive heart failure; PVD=peripheral vascular disease; CVA=cerebrovascular accident.

The baseline characteristics of the study cohort, i.e. those who opted for supportive management, as well as those of the dialysis group, are shown in Table 2. There was a female preponderance in both the study cohort and dialysis group. Patients in the supportive management group were older ($p<0.001$), more likely to have diabetes mellitus as a primary renal diagnosis ($p=0.016$), a history of congestive heart failure ($p=0.029$) and a history of cerebrovascular accident ($p<0.001$) compared to patients in the dialysis group. There was a similar percentage of patients with a history of acute myocardial infarction in the two groups. The mean Charlson Comorbidity Index of the supportive management group was 2 points higher than that of the dialysis group ($p<0.001$). Mean eGFR was also higher ($p=0.004$) in the supportive management group than in the dialysis group, which may be the result of the supportive management group having a higher percentage of diabetic patients who required initiation of RRT assessment at higher GFR. Hence, mean serum creatinine level was significantly lower ($p=0.005$) in the supportive management group.

The reported reasons for choosing supportive management are summarized in Table 3, although it should be borne in mind that patients may have multiple unstated reasons on which they base their decision. The commonest reasons reported were poor social support (28.4%), being too old to start dialysis (27.0%), and non-acceptance of dialytic therapy (24.3%).

Table 3. Reasons for choosing supportive management over dialysis given by the 74 patients in the study cohort*

	Frequency of response, n (%)
Patient's perception that they were too old for RRT	20 (27.0)
Patient not accepting dialysis therapy	18 (24.3)
Multiple comorbidities with poor functional state	16 (21.6)
Perceived as a burden to the family	3 (4.1)
Poor social support	21 (28.4)
Other	13 (17.6)

*Patients could give more than one reason. RRT=renal replacement therapy.

The most commonly reported symptoms by patients in the supportive management group are summarized in Table 4 [7,8], which includes data from other studies for comparison. Among the eight patients who reported pain as a presenting symptom, three had frequent gout attacks during assessment, one suffered from trigeminal neuralgia, one described classical angina, one had multiple musculoskeletal pain involving the knees, wrists and chest wall, one had prostate carcinoma with rectal

Table 4. Symptoms reported by patients in the supportive management group

Symptom	This study ($n=74$)	Yong et al [7] ($n=45$)	Saini et al [8] ($n=11$)
	n (%)	%	%
Dependent edema	37 (50.0)	31.1	73
Malaise and lethargy	30 (40.5)	68.9	100
Anorexia	28 (37.8)	28.9	55
Pruritus	24 (32.4)	57.8	55
Nausea and vomiting	17 (23.0)	11.1	9 (as difficulty in swallowing)
Pain	8 (10.8)	48.9	64
Insomnia	1 (1.4)	48.9	82
Cramps	0 (0)	33.3	64
Numbness	0 (0)	42.2	64
Restless legs	0 (0)	13.3	18

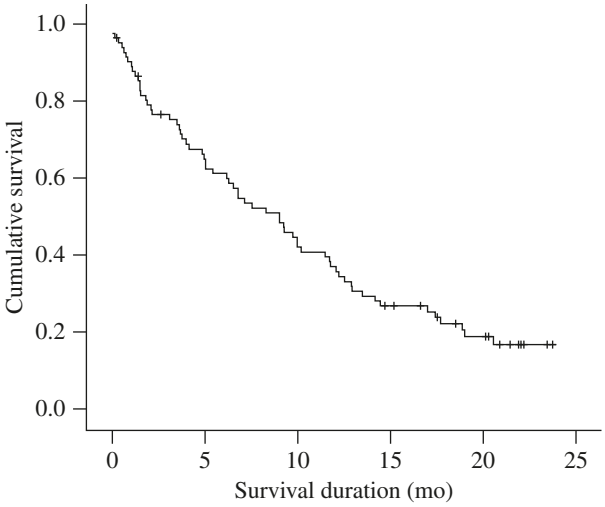

Figure. Kaplan-Meier curve of patient survival in the supportive management group.

invasion causing persistent pain over the pelvic region, and one had pain reported during the clinic visit but without further details recorded on the chart. They were all managed accordingly.

Concerning outpatient management, 23 patients (31.1%) in the study cohort were followed by nephrologists in the Renal Palliative Care Clinic, which had been set up in the middle of 2008. Of these 23 patients, six (8.1% of total study cohort) received erythropoietin injection, and four (5.4%) received androgen injection for correction of renal anemia. In addition, 15 (20.3%) received active vitamin D for parathyroid hormone suppression or correction of hypocalcemia.

Median survival in the supportive management group was 7.1 months (95% confidence interval, 5.0–9.7 months) (Figure). Five patients died within 2 weeks after RRT assessment. Another five patients died within the latter half of the first month after RRT assessment, representing late presentation of the disease or significant comorbidities. Fifty-one patients (68.9%) died within the first year after RRT assessment. The patient who was living in the private old age home at the time of RRT assessment remained well with supportive management, and died of acute myocardial infarction 5 months after RRT assessment.

Over the course of the follow-up study period (up to December 31, 2009), 60 of the 74 patients in the study cohort died. The most common causes of death were advanced uremia, systemic sepsis and cardiac event (Table 5). On review of the records of these 60 patients, 54 (90%) had DNR orders and their end of life was managed with comfort care. Another two patients had CPR initially but later changed to DNR after confirming the supportive nature of their management plan. The final four patients had CPR: three of them experienced sudden deterioration requiring admission to another hospital or to a surgical unit; one CPR was performed as requested by the patient's family.

Discussion

Supportive care for ESRD patients is different from supportive care for patients with terminal malignancies. There are always life-sustaining treatments available (e.g. dialysis) for renal failure patients, but it may be difficult to define who will benefit significantly from dialysis. Predicting prognosis is also difficult, making it hard to decide on whether or not to go ahead with dialysis. For some patients, dialysis may not be a feasible or practical solution to maintain a good quality of life.

We have described the RRT assessment for ESRD patients who presented in 2008 to our center. We emphasize the importance of advanced care planning on the initiation of RRT assessment. During the actual RRT assessment, there is an emphasis on shared decision-making among patients, family members, renal physicians,

Table 5. Causes of death in the 60 patients in the supportive management group who died

Cause of death	*n* (%)
Advanced uremia	17 (28.3)
Sepsis	17 (28.3)
Cardiac event	14 (23.3)
Cerebrovascular accident	3 (5.0)
Malignancy	1 (1.7)
Sudden death	5 (8.3)
Unknown	3 (5.0)

dedicated renal nurses and social workers. Patients and their family members are empowered to make important decisions on treatment options after they are provided with adequate information. The available dialysis modalities (continuous ambulatory peritoneal dialysis, automated peritoneal dialysis, hemodialysis) and non-dialytic supportive management with end-of-life care should always be discussed explicitly during the assessment [9]. This is of paramount importance as information-giving rectifies misconceptions, addresses uncertainties and fears, and provides patients and their families with insight into their illnesses, encouraging subsequent willingness to accept the formulated treatment [10]. They would then be better prepared for the course of their illness and subsequent deterioration, including death. They would have an appropriate management target geared towards symptom relief rather than a day-to-day approach. Repeat assessments are essential to identify a patient's needs and hopes before a firm commitment is made on a specific treatment plan. The patient's preference should be respected, and changes in preference should also be respected, especially for those who can demonstrate the rational thinking behind the change [11].

The incidence of the various symptoms reported by our patients on supportive care was, in general, lower compared to Western data (Table 4). This could be the result of differences in study design, such as under-reporting in retrospective non-questionnaire based studies, and biases posed by clinicians. This was particularly true for the less common and usually neglected symptoms such as insomnia, cramps, numbness and restless legs. From the Yong et al study [7], which was a questionnaire-based study conducted in Hong Kong, these symptoms were less prevalent compared to Western data. A likely explanation for this finding may be the differences in cultures. Symptom perceptions and burdens are known to be heavily influenced by cultural differences [12]. Further studies on symptomatology, especially on the longitudinal progression of these symptoms with respect to the disease trajectory, are important in the management of patients on supportive care as symptom control is an essential element. In addition, we noted the under-utilization of erythropoiesis stimulating agents or androgen injections, both of which can improve symptom control by correction of renal anemia. Alternatively, blood transfusion as required can serve the same purpose.

In this study, we found that a high number of patients on supportive care chose to institute DNR orders. We believe this to be an illustration of the success of advanced care planning during RRT assessment and of the continuous support during follow-up. Patients had anticipated death and knew what to expect. They retained a sense of control over their choices and had their wishes respected. Moreover, 56.7% of patients died due to causes unrelated to uremia (i.e. due to sepsis, cardiac events and cerebrovascular accident; Table 5), and patients on supportive care in this part of the world are admitted to hospital for final events.

Supportive management of ESRD patients who opt against dialysis is at an early stage of development, with plenty of room for growth and improvement, such as better collaboration among nephrologists, renal nurses, social workers, palliative care physicians and palliative care nurses. The provision of community services, end-of-life care and bereavement services are also integral parts of care delivery. There is a need for palliative care training in the nephrology training curriculum, and a need for nephrology training in the palliative care training curriculum, as the two subspecialties complement each other in the supportive care of ESRD patients.

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