

Gazing into the crystal ball of mortality prediction in conservative kidney care

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Since Clyde Shields became the first patient with kidney failure to undergo long-term haemodialysis in 1960, the advent of kidney replacement therapy (KRT) has provided a means of organ sustenance and life prolongation for more than 2.7 million patients with chronic kidney disease (CKD) today.¹ In the early days of dialysis, due to resource limitations, this treatment was prioritised for younger patients (defined as aged 25–45) with minimal comorbidities (i.e. “absence of long-standing hypertension and its permanent complications, particularly coronary artery disease and cerebrovascular disease”) and of “value to the community”—as determined by an Admissions Advisory Committee, nicknamed by some then as the “God Squad”.² Decades later, with advancements in medical science, improvements in dialysis technologies and increased funding support from governments worldwide, dialysis has become widely accessible. Patients considered for dialysis are getting older, multimorbid and increasingly frail.

In Singapore, patients aged ≥ 70 comprise the second largest (29%) group on KRT, accompanied by a continuous climb in the incidence of definitive dialysis.³ Experience has taught us that living with chronic organ dysfunction presents its own challenges, more so for those with CKD who are multimorbid. A systematic review in 2021 found that the survival benefit of dialysis was lost in patients older than 80 years of age and in older patients with comorbidities. Life satisfaction diminishes after dialysis initiation, with symptom burden comparable to patients on chemotherapy for advanced cancer.⁴ Nevertheless, in a carefully selected cohort of elderly patients with relatively low comorbidity burden, dialysis may still confer a meaningful survival advantage in the initial years of initiation, especially if they do not have diabetes or ischaemic heart disease.⁵

Conservative kidney management (CKM) is now widely accepted as a fourth treatment option for kidney failure, apart from haemodialysis, peritoneal dialysis and transplantation. CKM, at best, is defined as the care of people with kidney failure that focuses predominantly on providing kidney supportive care

(KSC) to promote quality of life while excluding KRT. The guiding principle is the alignment of all active therapy plans with the individual’s preferences, goals, wishes and prognosis. A patient-centred strategy aimed at minimising complications, managing symptoms, facilitating advanced care planning and integrating simultaneous palliative care, CKM has been associated with improvements in quality of life, reduction in hospitalisation rates and better symptom control.⁶ Consistent across large cohort studies and systematic reviews, the estimated median survival for older patients (age ≥ 65) on conservative management (CKD G4–5) varies internationally and substantially, depending on the estimated glomerular filtration rate (eGFR), age, comorbidity burden and care setting.⁷ More specifically, median survival estimates decline as kidney function worsens, ranging from 15 months (interquartile range [IQR] 7–34 months) when eGFR falls below 15 mL/min/1.73 m² to 8 months when it drops to ≤ 10 mL/min/1.73 m² (IQR 3–18 months).⁸ Age further influences survival, with estimates ranging from 7–41 months for those aged 70–79 and 1–37 months for those ≥ 80 years.⁹ Survival diminishes with eGFR, advancing age, increasing frailty and multimorbidity, underscoring the need for individualised prognostic estimates that reflect each patient’s unique clinical profile.¹⁰ Currently, there is no standardised definition of “conservatively managed” patients; hence, the determination of survival according to the data collection methods employed by different institutions. It has thus been challenging to predict survival reliably due to heterogeneity and paucity of data.

In this issue of the *Annals*, Teh et al. conducted a single-centre, prospective cohort study of adult patients with kidney failure on CKM.¹¹ They aimed to determine baseline predictors of mortality, apply functional assessment tools for prognostication and identify transition points to palliative care. Baseline eGFR and serum albumin were identified as significant independent multivariable predictors of 1-year mortality. The Palliative Performance Scale (PPS) was also found to be a strong predictor of survival. From

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these, the authors proposed a tailored 3-phase approach to CKM that describes the expected trajectory of kidney failure at an eGFR of ≤ 10 mL/min and encompasses suggested care goals and management aims of each phase of progression based on the eGFR and PPS scores. They proposed criteria for referral to hospice services in efforts to structure care delivery and integrate proactive, timely supportive care onboarding at an eGFR of < 5 mL/min or a drop in PPS to < 50 , which translates to a median survival of 3 months, as opposed to leaving it to individual physicians' "gut feel".

We commend the authors for a well-conducted study. While baseline predictors of mortality have been fairly extensively studied in Western cohorts, this study adds value in contextualising predictors to a Southeast Asian cohort. Serum albumin and creatinine are blood biomarkers that can be easily obtained and are routine measurements in CKD care. The PPS, a 10-point interval scoring scale, is a modification of the Karnofsky Performance Scale (KPS), which assesses a patient's functional capacity in the domains of ambulation, disease activity level, self-care, oral intake and consciousness level. Compared to the Eastern Cooperative Oncology Group scale, which only assesses ambulatory function, it provides a more nuanced assessment while being simpler to implement than its 12-point Likert scale counterpart—the interRAI Changes in Health, End-Stage Disease, Signs and Symptoms Scale. It is applicable across various healthcare settings and generalisable to a broader population with different end-of-life diagnoses.¹² The PPS is relatively simple to score once one is familiar with it. Hence, these 3 parameters can be easily used in a clinical setting to predict 1-year mortality. The authors also provide a reasonably practical framework that can be implemented and scaled for a clinical service, including the provision of timely hospice assistance or end-of-life care. The current practice and timing of hospice referrals are heterogeneous, and this framework provides a degree of objectivity to avoid placing unnecessary strain on hospice services.

This study cohort differs from other larger cohorts in various aspects, including a lower prevalence of ischaemic heart disease, a higher prevalence of cancer, higher functional independence and relatively low symptom burden. This may reflect the profile of patients who chose to pursue CKM as their treatment option while they remain relatively symptom-free, rather than the more "typical" patient with kidney failure who may be more multimorbid and have a higher symptom burden. Ironically, patients in the latter group are those who may benefit more from CKM. While we acknowledge the limitation of the time-based, observational nature of enrolment for

this study, future studies should explore differences in baseline characteristics of patients excluded from enrolment or enrolled patients who subsequently withdrew due to dialysis initiation. This would provide further insights into both medical and psychosocial-behavioural factors for this CKM model and framework in a real-world setting.

The authors assessed symptom burden and frailty indices using several scores and scales. Except for the Edmonton Symptom Assessment System Revised: Renal and Charlson Comorbidity Index, all the other measures were univariate predictors of 1-year mortality. However, none of these measures were significant, independent multivariable predictors of 1-year mortality. There may be several explanations for this observation. There may be substantial collinearity between some of these measures, which results in wide confidence intervals and loss of statistical significance. The study may also be underpowered, resulting in type II error, given the small number of events (mortality) in a small cohort relative to a large number of covariates examined. Further study validating the application of these respective scores and scales in a kidney disease model would shed additional light on both the clinical validity and utility of these measures.

Lastly, in describing early observations from their programme the authors have taken the first step in optimising personalised CKM care. In addition to the "hard" outcomes of palliative referrals, reduction in hospitalisation, etc., it would be most important to obtain patient-reported outcome measures (or PROMs) to show that KSC implemented through this CKM programme does improve the quality of life and symptom management in these patients, and fulfil their wishes of dying well. We look forward to a follow-up analysis of the longitudinal progression of outcomes.

As CKM takes on a more prominent role in integrated kidney care, a universal definition of "supportive care" is sorely needed. This will facilitate the standardisation of terminology, referencing the specific domains and tasks that KSC encompasses, and allow comparison across studies for better predictive tools and correlation with outcomes. The International Society of Nephrology has recognised this gap and has undertaken the development of consensus definitions for CKM and KSC in addition to identifying key considerations for the development of CKM programmes to promote international acceptance and inculcate global awareness.

As the biblical saying goes, "All things are permissible, but not all things are beneficial." Even as advances in dialytic therapies now offer many CKD patients a way out of imminent demise, we must

always remain cognisant that not all will reap the benefits of chronic dialysis. While medical practitioners aim to live out the maxim of *primum non nocere* (“first, do no harm”), the heart of any CKM programme lies in making the patient the main author of their own therapy. It remains our calling to help patients live well and die well.

Ethics statement

Not applicable

Declaration

The authors have no affiliations or financial involvement with any commercial organisation with a direct financial interest in the subject or materials discussed in the manuscript.

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