

The challenges of renal replacement therapy and renal palliative care in the elderly

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This review is based on a presentation given by Professor Isles at the joint Royal College of General Practitioners and RCPE Medicine for the Elderly Symposium on 1 April 2011.

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ABSTRACT The main aim of this review is to let general practitioners and physicians understand what happens to older patients after referral to the renal service. Usually, most patients will be managed completely by the renal team, either because the patient requires dialysis or because conservative but specialised care is appropriate. The recent increase in dialysis rate can mostly be accounted for by older patients for whom such demanding treatment was previously thought to be contraindicated. The decision to dialyse the elderly still remains difficult, with recent data suggesting that if there are significant comorbidities the survival advantage of dialysis in patients over 75 years of age is unlikely to be more than four months. Towards the end of life, conservative treatment is not simply a decision not to dialyse, but comprises active disease management, including treatment of anaemia and other supportive care, which may become increasingly complex, e.g. pain relief with fentanyl and alfentanil. Older patients who decide to accept dialysis treatment contend with all the usual end of life issues of older people. They have an additional option, denied to the rest of us, of dialysis withdrawal; this effectively allows them to die at a time of their choosing.

KEYWORDS Dialysis, older patients, last year of life, palliative care, survival, conservative therapy

DECLARATION OF INTERESTS No conflict of interests declared.

INTRODUCTION

Six years ago, El Nahas and colleagues anticipated that 'the worldwide rise in the number of patients with chronic kidney disease (CKD) and consequent end-stage renal disease requiring renal replacement therapy (RRT) threatens to reach epidemic proportions over the next decade'.¹ Fortunately their alarmist view is incorrect, in the UK at least. Most patients with CKD stage 3 do not progress to stages 4 or 5, which together account for no more than 0.3% of all patients with chronic kidney disease.² In the UK, the dialysis rate in 1981 was under 27 per million per year³, a figure lower than most European countries. Later it seemed that patients were never too old for dialysis and the acceptance rate quadrupled to 123 per million per year in 2005.⁴ For the five consecutive years since then, Scottish Renal Registry data show that the 'take on' rate dropped progressively and in 2010 stood at 97 per million per year⁵ (Figure 1). The fall in this rate seems likely to be due to fewer older patients starting dialysis; in 2007 43% of all patients were over 65 years of age, compared to 54% in 2003.⁴

This does not mean that the incidence of established renal failure in the elderly is declining or that the challenge of treating an ever older population has gone away. Prevalence data from the Scottish Renal Registry show that from 2001 to 2010 there was a year on year rise in the total number of patients on RRT.⁵ Since Scottish Government data predict a 70% increase in the number of people over 75 between 2008 and 2033⁶, this increase in RRT is likely to continue. It is against this background that we will review the assessment and management of the elderly with advanced kidney disease. We start with assessment of renal function and treatment options, and then review the latest evidence on survival and quality of life, before closing with observations on the last year of life, dialysis withdrawal and renal palliative care.

ASSESSMENT OF RENAL FUNCTION

A useful rule of thumb is that every time the creatinine doubles, the glomerular filtration rate (GFR) will halve.⁷ Thus, if a serum creatinine of 62.5 µmol/l and a GFR of 100 ml/min is our starting point, this means that when

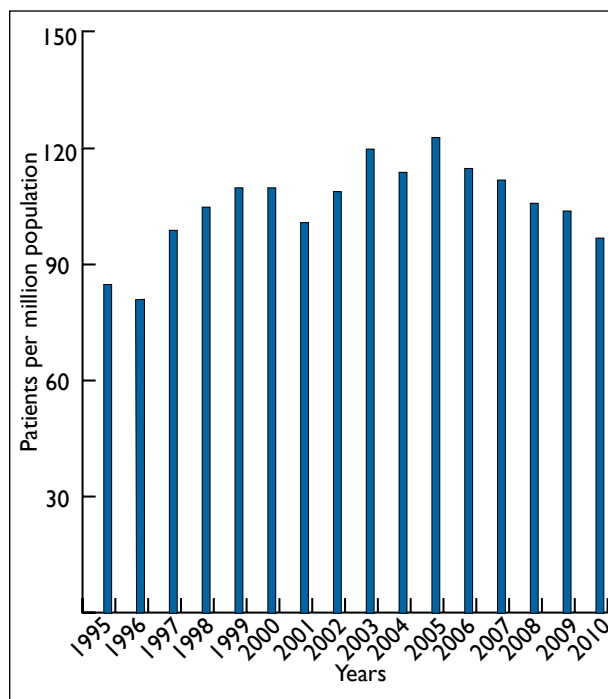


FIGURE 1 Incidence of renal replacement therapy per million population. Scottish Renal Registry, 1995–2010.

the serum creatinine exceeds 500 $\mu\text{mol/l}$, the GFR will have fallen below 12.5 ml/min. No one mourns the demise of 24 hour urine collections as the basis for calculating creatinine clearance; not only was the collection messy and cumbersome but the results obtained were frequently inaccurate and misleading. The standard method for estimating GFR now is based on the MDRD equation derived in the study on modification of diet in renal disease which estimates GFR on the basis of a patient's age, serum creatinine, gender and race². So, an 82-year-old white female with serum creatinine of 300 $\mu\text{mol/l}$ has an estimated glomerular filtration rate (eGFR) of 14 ml/min (confidence interval [CI] from 10 to 18 ml/min). All biochemistry departments in Scotland now use this formula to report eGFR, but they do not routinely give confidence intervals. The main weakness of the MDRD formula is that it takes no account of muscle mass, which influences the amount of creatinine generated. For patients at extremes of body weight, creatinine clearance is best estimated by the Cockcroft Gault formula (which takes body weight into account).² The take-home message for general physicians and geriatricians is that the underweight elderly female with serum creatinine 300 $\mu\text{mol/l}$ may well have end-stage renal failure.

TREATMENT OPTIONS

In theory, all patients with established renal failure have the option of hospital haemodialysis, home haemodialysis, peritoneal dialysis (PD), transplantation or conservative

care. In practice, no Scottish patients over the age of 80 years are currently being treated by home haemodialysis. There is no theoretical reason why an elderly renal patient should not have a pre-emptive transplant, though this also does not happen. If a trial of RRT is chosen, this effectively means a choice between hospital-based haemodialysis and peritoneal dialysis at home. Studies suggest that with appropriate multidisciplinary support, over 50% of an elderly population eligible for PD will choose this form of treatment.⁸ However, the uptake is much lower.⁹ A UK Renal Registry analysis of patients under 65 years of age on 31 December 2008 showed that a third were treated by haemodialysis, 59% had a functioning transplant and 8% were undergoing PD. In the over 65s the proportion with a functioning transplant was 22%, with an increased proportion of hospital haemodialysis rather than PD (Figure 2).¹⁰

It is likely that in the elderly, physical problems, social circumstances and cognitive impairment conspire to make PD less attractive. This is ironic given that in a recent UK study, scores estimating the intrusion of therapy and quality of life were found to be better in PD patients than in those who received haemodialysis.¹¹ Some Scottish units may promote PD more than others, as judged by the 2.5-fold variation in uptake reported by the Scottish Renal Registry in 2008 (Figure 3).⁴ A recent development has been assisted Automated PD (aAPD)^{12,13}, which allows the patient to be treated at night, with a portable machine that pumps fluid in and out of their peritoneal cavity automatically. With aAPD, a fully trained healthcare assistant visits daily – emptying drainage bags, checking drained fluid for cloudiness, setting up the machine for the next treatment, inspecting the catheter exit site and reviewing stocks of treatment fluids and drugs. These assistants maintain contact with the parent unit which intervenes if problems arise. Latest data suggest a near linear increase in aAPD, used for 135 UK patients by January 2011.¹⁴

SURVIVAL

Some years ago we compared survival of all Scottish patients over 80 years of age who were dialysed between 1994 and 2001, with age-matched myocardial infarction (MI) and lung cancer controls, using data supplied by the Information Services Division of the Scottish Health Service.¹⁵ There were 213 CKD, 14,398 MI and 4,655 lung cancer patients in this analysis. Median survival in days, from 90 days after the start of RRT, hospital admission for MI, or cancer diagnosis was 459 days (RRT patients), 1,242 days (MI patients) and 141 days (patients with lung cancer). Thus octogenarians who are dialysed can anticipate, on average, almost one and a half years on dialysis. Similar survival was reported by the North Thames Study in 2001, which also showed that only age over 80 years and the presence of peripheral vascular disease could predict outcome at 12 months.¹⁶

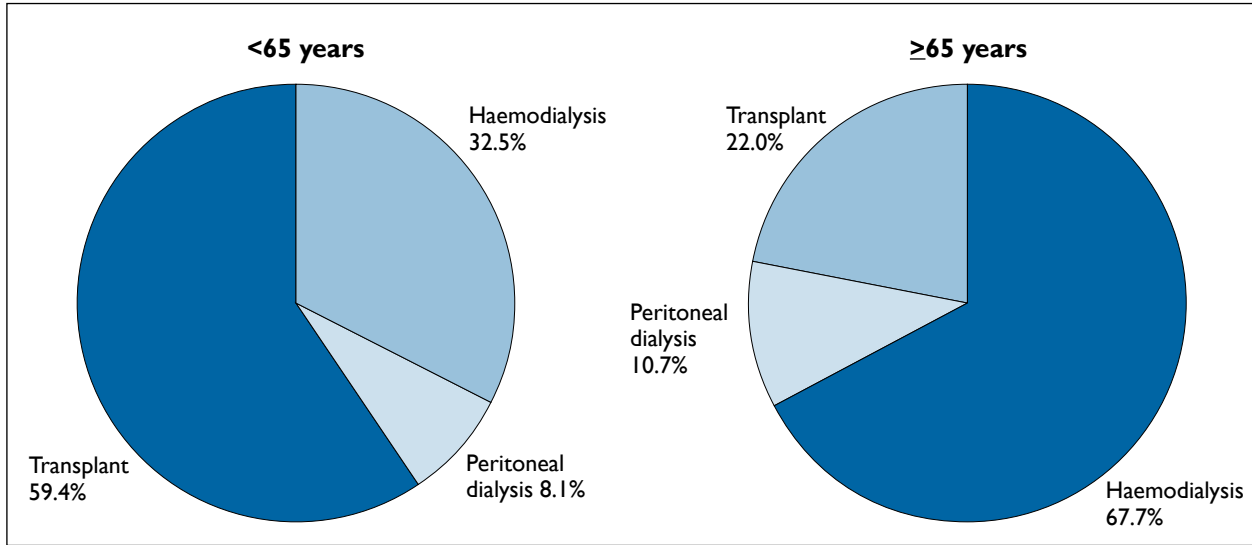


FIGURE 2 UK Renal Registry data showing treatment modality for patients under and over 65 years on 31 December 2008.

A recent report from the Lister Unit in Stevenage revisited the survival of elderly CKD patients in a non-randomised study.¹⁷ Eighty-two per cent (689/844) were treated by RRT while 18% (155) received conservative management. In these patients, comorbidities (cardiac, peripheral vascular, cerebrovascular, diabetes, respiratory, cancer and cirrhosis) were assigned severity scores from 1 to 4. Survival was calculated from the first recorded eGFR of less than 15 ml/min, not from the onset of dialysis. At first glance it appeared as if patients treated by RRT (median survival six years) did much better than those who received conservative care (median survival 2.5 years) but when subjects aged over 75 years were analysed separately, with survival adjusted for age, gender, ethnicity, and the presence of diabetes or other

high comorbidities, the median survival advantage associated with dialysis fell to four months in the group with comorbidities. The take-home message was that patients over 75 years of age who received RRT achieved a worthwhile survival advantage if there was low comorbidity but that median survival if there was high comorbidity was poor.

QUALITY OF LIFE

If the survival advantage of dialysis is not as great as hoped for, what kind of quality of life can an elderly patient on dialysis expect? We would anticipate that they would be susceptible to most of the so-called ‘geriatric giants’: infection, immobility, instability, incontinence and intellectual impairment. In CKD stage 5, infection is an ever-present increased risk, particularly with tunnelled lines, while immobility is common, demonstrated by the number of patients who attend dialysis in wheelchairs. Instability leads to falls and these are greatly increased in CKD.¹⁸ Urinary incontinence may be a lesser problem than in the general population since many dialysis patients pass little or no urine. Impaired intellect occurs in 13% of patients with an eGFR of less than 30 ml/min; when it occurs it adds to the burden of a very demanding form of treatment.¹⁹

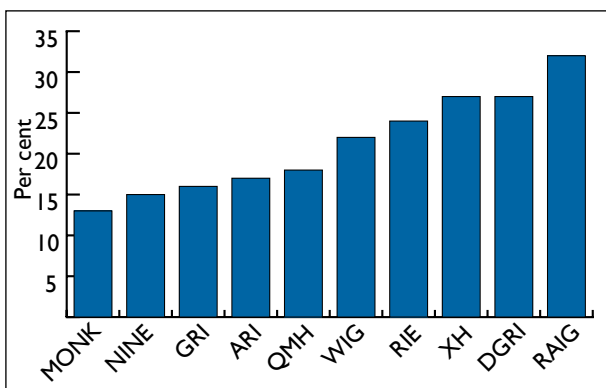


FIGURE 3 Per cent of renal patients on home therapies (excluding transplant) by Scottish Renal Units on 13 December 2007. Monk = Monklands; Nine = Ninewells; GRI = Glasgow Royal; ARI = Aberdeen Royal; QMH = Queen Margaret Hospital, Dunfermline; WIG = Western Infirmary, Glasgow; RIE = Royal Infirmary, Edinburgh; XH = Crosshouse; Kilmarnock, DGRI = Dumfries & Galloway Royal Infirmary; Raig = Raigmore, Inverness.

Quality of life was measured in the North Thames Dialysis study using Short Form 36 (SF36) scoring.¹⁶ Physical quality of life was significantly lower in the elderly RRT patients than in UK/US age-matched populations. In contrast, the emotional quality of life of the elderly RRT patients was as good as that of their peers in the general population.¹⁶ A recent US study reported a marked decline of functional status among nursing home residents after initiation of dialysis for end-stage renal disease.²⁰ Another US study followed the

progress of all patients 80 years or older who started dialysis between 2000 and 2005.²¹ At the start of RRT, 78% were living independently at home, 15% were living at home with assistance and 6% were already in nursing homes. After two years of follow-up only 11% of the original cohort (18% of those still alive) were still living independently at home. The remainder required community or private care support or had been transferred to a nursing home.²¹

THE LAST YEAR OF LIFE

Living and Dying Well, a National Action Plan for Palliative and End of Life Care in Scotland, gives clinical prognostic indicators for each of the major organ failures that might suggest a patient was entering their last year of life.²² For CKD the clinical prognostic indicators of the final year of life are: 1) CKD stage 5 patients not seeking RRT or discontinuing such treatment, from choice, due to frailty or too many comorbid conditions and 2) CKD stage 5 patients whose condition is deteriorating and who are likely to die in the next year. The *Living and Dying Well* document also states that comorbidity is the best predictor of mortality, giving as measures: weight loss >10% in the last six months; general physical decline; serum albumin <25 g/l; and dependence on others for most activities of daily living.²²

A Scottish survey of all patients in an acute hospital on 31 March 2008 showed that 4,450/14,868 (31%) had died by 31 March 2009. The proportion dying within that year rose to 38% when the analysis was limited to patients aged 65 years and over. When deaths in the over 65s were analysed by specialty it was found that deaths in renal medicine (50%) exceeded those of general medicine (41%) and of geriatric medicine (40%).²³ In an analysis of emergency medical admissions in Dumfries, 59/145 (41%) of patients who were in hospital on 1 September 2009 had died within one year, only five (8%) of these having died at home (Figure 4). A recent study from Ireland shows the inexorable increase in the proportion of deaths occurring in hospitals or institutions from 1885 (15%) to 2005 (75%).²⁴ Together, these data suggest that we should begin to re-orientate our medical practice to meet the palliative and supportive care needs of elderly patients with end-stage renal disease, more fully, when they are admitted to hospital.

DIALYSIS WITHDRAWAL

Dialysis withdrawal is probably the most common cause of death for patients on RRT. In a French study, 196 of 1,436 dialysis patients died during follow-up.²⁵ The single most common cause of death was dialysis withdrawal (defined as death occurring more than three days since the last dialysis), which accounted for no fewer than 20% of all deaths. Mean survival time after the last treatment session was 8.5 days (median seven days). Survival is

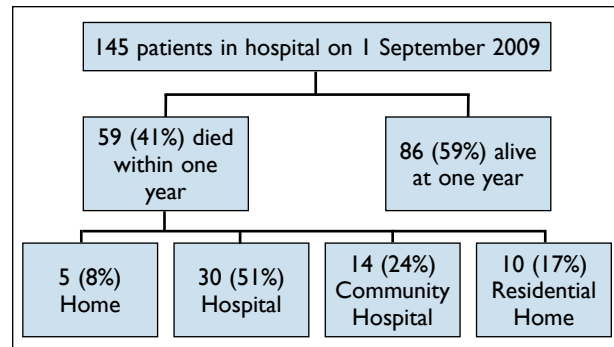


FIGURE 4 Emergency admissions to medicine in Dumfries on 1 September 2009.

likely to be longer in patients with residual renal function. Advanced care planning may not have been common in the units investigated because 32 of the 40 patients in whom dialysis was withdrawn were reported as being too weak or ill to participate in the decision.

Discussion of dialysis withdrawal can be a very sensitive issue if it is seen as the withholding of a life-saving treatment in an elderly patient. When Professor P Hanlon observed in a recent *Newsnight* interview that death was part of the cycle of life and that it might not always be appropriate to treat older people in their last year intensively²⁶, he received some very negative press. However, many elderly dialysis patients perceive their quality of life to be much better than we might surmise. Nephrologists need to accept that, though it may not be what we would wish for ourselves, some patients may be very content to sit surrounded by their family. There also needs to be debate about whether the National Health Service (NHS) can afford such an expensive and demanding treatment for people with restrictions on their day to day lives.

RENAL PALLIATIVE CARE

For elderly dialysis patients, renal palliative care should begin at the time of diagnosis and continue throughout the rest of the patient's life. The elements of such disease care include symptom control, psychosocial and spiritual support, in addition to consideration of the particular ethical issues of dialysis.²⁷ The National Service Framework for Renal Services states that people with established renal failure should receive 'timely evaluation of their prognosis, information about the choices available to them, and for those near the end of life, a jointly agreed palliative care plan, built around their individual needs and preferences'.²⁸ Good renal palliative care should include advanced care planning even if most renal patients appear reluctant to consider this option. Renal palliative care then continues with attention to symptoms that are often under-recognised. A systematic review of 60 studies in 2006 showed the following values for weighted mean symptom prevalence in end-stage

renal disease: fatigue/tiredness (71%), pruritis (55%), constipation (53%), anorexia (49%), pain (47%), sleep disturbance (44%), anxiety (38%), dyspnoea (35%), nausea (33%), restless legs (30%), and depression (27%).²⁹ Multiple symptoms were common in patients on dialysis.

Treatment of symptomatic anaemia with erythropoiesis stimulating agents and intravenous iron, one of the renal success stories of the last decade, can reduce the need for blood transfusions.³⁰ Evidence from the Liverpool Care Pathway study suggests that pain is also a frequent symptom in patients with end-stage CKD and that pain control is often challenging.³¹ In renal failure, active metabolites of morphine accumulate and cause severe symptoms (myoclonic jerks, profound narcosis and respiratory depression), so before relieving pain we should use those opiates that do not accumulate in renal disease such as fentanyl or alfentanil.³² Fentanyl can be given by patch, subcutaneously or intravenously, and in practice a fentanyl patch, with oxycodone orally at home, or alfentanil subcutaneously in hospital, is usually effective. Patients whose pain is not controlled despite such opioids should be referred to the palliative care team if this has not been done already.

The trajectory for organ system failure is shown in Figure 5.³³ A gradual decline in function punctuated by hospital admissions which become more frequent towards the end of life is common in renal failure. Death often seems 'sudden' to many relatives of renal patients even if the gradual and progressive decline in that patient's health has been obvious to the hospital team. Most patients whose dialysis is withdrawn die after becoming progressively more drowsy and slipping into uraemic coma. If death occurs suddenly, asystole due to hyperkalaemia is the likely trigger. Nausea and dyspnoea can be controlled relatively easily by haloperidol, fentanyl or alfentanil in a syringe driver, although pain control may remain problematic. One US study showed that only 15% of patients had 'bad deaths' following the decision to terminate dialysis; the study highlighted the complexity of decisions to cease treatment and the importance of excellent palliative care.³⁴ Many renal units now have renal palliative care nurse specialists who are skilled in uraemic symptom control and whose remit also includes support for the family and carers, both before and after death.³⁵

CONCLUSIONS

1. Elderly patients with a serum creatinine of >300 $\mu\text{mol/l}$ may well have end-stage renal disease, especially if they are female and underweight.
2. Age is not a contraindication to dialysis in the elderly but significant comorbidities may be.
3. Peritoneal dialysis is under-utilised in the elderly, but assisted PD may mean that more elderly people can be treated in this way.

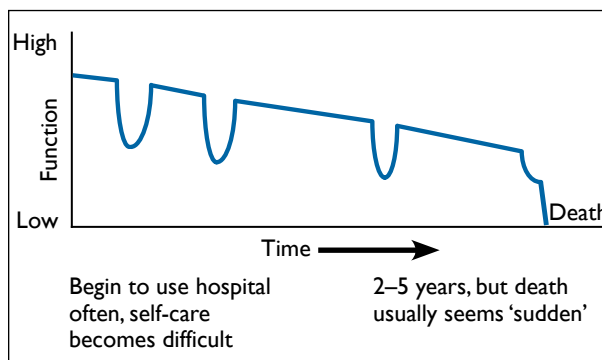


FIGURE 5 Organ system failure trajectory.

4. Dialysis in patients over 80 years of age may prolong life by only a few months, if significant comorbidities are present.
5. Emotional quality of life on RRT appears to be as good as that of patients of similar age who do not have CKD.
6. Renal patients have an option denied to the rest of us of dialysis withdrawal, which effectively allows them to die at a time of their choosing.
7. Dialysis withdrawal is now the most common cause of death for patients on RRT.
8. Renal palliative care for elderly dialysis patients should begin at the time of diagnosis and continue throughout life. It differs from non-renal palliative care in many respects, not least of which are the efficacy of erythropoiesis stimulating agents and intravenous iron for renal anaemia and the use of fentanyl and alfentanil for pain control.
9. A 'good renal death' is possible but only if good palliative care is available.

While these challenges mainly concern the nephrologist who manages chronic renal disease in the elderly, we feel that many will also be of interest to other physicians.

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