Review Article

Future of home haemodialysis in Australia and New Zealand

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SUMMARY: Maintenance haemodialysis (HD) was pioneered in Seattle and rapidly became home-based. When dialysis treatment began in Australia and New Zealand, home haemodialysis (HHD) became the predominant form of dialysis. When compared with in-centre conventional dialysis, HHD is associated with superior survival and quality of life and is cheaper. There is currently significant interest in increasing the frequency and duration of dialysis and in providing more flexible dialysis regimens for patients. If the likely benefits of these treatment changes are to be fully realized HHD and self care HD services will need to expand. Dialysis units in Australia and New Zealand are better equipped than most to respond to this challenge.

KEY WORDS: community health services, haemodialysis, health care costs, home, quality of life, self-care, survival rate.

BACKGROUND

Haemodialysis (HD) was the first durable form of maintenance dialysis. Home haemodialysis (HHD) began in Japan in 1961 and became available in Boston in 1963 and Seattle and London in 1964. HHD began in Australia in 1967 when John Dawborn and Sue Evans trained Peter Morris, a Sydney businessman, to carry out HD at home with an arteriovenous shunt and a Kiil artificial kidney. HHD began in New Zealand in 1969 following the establishment of a National Home Haemodialysis Training Unit in Christchurch headed by Peter Little. There were no formal guidelines as to patient selection or treatment parameters. In 1980, 50% of Australian and 55% of New Zealand kidney-failure patients were on HHD. In 2002, the respective figures were 11% and 14%, with a total of 987 HHD patients in both countries. Over the past decade, the absolute number of patients on HHD has remained relatively unchanged. The current state of treatment for end-stage renal disease (ESRD) in Australia and New Zealand has been reviewed recently by the Australian and New Zealand Dialysis and Transplant Registry. In both countries, the fastest growing dialysis modalities are satellite HD and automated peritoneal dialysis (APD). There is still significant clinical expertise and interest in HHD, as shown by the success of the First Australasian Home Haemodialysis Workshop held in Christchurch in July 2004.

In the 1970s, HHD was the predominant form of dialysis in England and Wales. HHD is still offered by 86% of units, but only 5% of patients are on this therapy, while 22% are on satellite dialysis. In Europe, less than 5% of patients are on HHD. In the USA, where maintenance dialysis and home treatment were established, HHD is rarely offered and only 0.4% of all dialysis patients are on HHD. Interestingly, when US nephrologists were asked about optimal dialysis modality selection the majority felt that HHD was underutilized.

Even when adjustments are made for comorbidities, HHD is associated with better outcomes than hospital or satellite HD for most measures of effectiveness. A recent systematic review found that HHD was associated with a better quality of life and survival than other forms of HD. Although HHD can be disruptive for families, measures of general and psychological health and the likelihood of employment are superior when compared with centre or satellite dialysis. A comparison of centre HD and HHD patients in the US showed superior survival for HHD when adjusted for comorbidities. A case cohort study from a single centre in Switzerland also found a survival advantage for HHD compared with centre HD. Cost will always be a barrier to treatment of ESRD, and HHD is usually cheaper than other forms of dialysis and about half the cost of centre HD in Australia and New Zealand.

There are a number of possible explanations for the superior outcomes associated with HHD. Despite efforts
to adjust for comorbidities in the comparative studies, the results might still have been affected by selection bias. In contrast, HHD might provide more dialysis and better control of fluid and blood pressure; factors that have been shown to improve patient outcomes.\textsuperscript{18–22} The majority of patients on HHD use arteriovenous fistulae, the vascular access associated with the lowest rates of intervention and hospitalization and the best patient survival.\textsuperscript{21,22} Thus, the predominant use of arteriovenous fistulae by HHD patients might confound survival analyses. Patients who take some responsibility for their own care do better wherever they dialyse.

A number of explanations have been proposed for the decline in home HD, including: changes in funding arrangements; an ageing, more dependent population; the advent of continuous ambulatory peritoneal dialysis and APD; satellite HD; easier access to centre HD units; and improvements in transplantation.\textsuperscript{23} Fewer staff have had experience with HHD and might be unaware of the potential and benefits of this type of dialysis therapy. A cross-sectional survey of Canadian centre HD patients found the following reasons for patients not selecting self-care: poor explanation of modality choices by staff; fear of performing dialysis without direct supervision by a nurse; fear of needles; lack of space at home; and fear of change and social isolation.\textsuperscript{24}

The previous lack of investment in the technical development of home HD care by the industry has meant that home HD patients are expected to use dialysis machines designed for hospitals and dialysis staff.

WHAT HAS BEEN LEARNT IN AUSTRALIA AND NEW ZEALAND ABOUT HHD?

A successful HHD programme demands a treatment team who firmly believe that home treatment enables the best outcomes for patients. This team should be multidisciplinary and comprise nephrologists, nurses and clinical technicians who are skilled in training patients for home dialysis and are certain of their roles. The home dialysis unit training staff must espouse the philosophy that the more patients can do for themselves the better the outcome. This philosophy also values patient autonomy and responsibility and allows flexible solutions for individual patients. A dedicated surgeon(s) is an absolute requirement for the provision of durable, patient-friendly vascular access. Training for HHD is best undertaken in an environment more like the home than in a hospital and geographically separate from hospital and in-centre dialysis units. It is important to provide close liaison with, and support for, general practitioners caring for home dialysis patients during predialysis assessment, training and after return home on HHD.

Early referral of patients with progressive renal disease enables sufficient time for adequate education about treatment choices and assessment of potential community supports.

There should be appropriate support from the dialysis unit for patients at home but this must not erode the patient’s autonomy or responsibility for their dialysis. Paid helpers or carers might be necessary for genuine ‘loners’ and for those whose ability to manage declines or whose supports fail. Appropriate ‘consumer-friendly’ technology is necessary for successful home dialysis. Dialysis equipment must be simple for the patient to learn how to use. All dialysis equipment must be easy to install in the average home without posing major electrical or plumbing challenges, and be reliable and easy to service. Overnight dialysis is safe and remote monitoring is not necessary.

WHY DOES HHD HAVE A FUTURE IN AUSTRALIA AND NEW ZEALAND?

In a cost-constrained health economy, where peritoneal dialysis has reached its peak and the deceased donor pool is stable, the lower costs of HHD enable more patients with ESRD to be treated. The expected growth in patient numbers is unlikely to be paralleled by a similar increase in the number of nephrologists, renal nurses and dialysis technicians. These trends in health workforce numbers necessitate more patient involvement in management of chronic diseases. Currently, centre dialysis units are full and any expansion of these facilities is expensive. Professional and consumer demand for the provision of more optimal dialysis with flexibility in duration and frequency can only be satisfied by increasing HHD. A significant proportion of our populations lives in rural areas where provision of centre and satellite dialysis is not always cost-effective. Industry has awoken to the problems of conventional HD and is investing in user-friendly technology for home dialysis.

CONCLUSION

HHD has an increasing role in Australia and New Zealand, provided there is support from nephrologists, other dialysis staff and industry. The undoubted benefits of greater flexibility in frequency and duration of treatment for patients can only be realized by an expansion of HHD, and possibly self-care dialysis. HHD remains the most cost-effective form of dialysis and is associated with the best outcome for patients.

REFERENCES
