HEALTHCARE DELIVERY

An effective approach to chronic kidney disease in South Africa

M R Moosa, A M Meyers, E Gottlich, S Naicker

Rafique Moosa, MB ChB, FCP (SA), MD, FRCP (Lond), is a member of the Ministerial Advisory Committee on Transplantation, Executive Head of Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Tygerberg, Cape Town, South Africa, and a specialist nephrologist at Tygerberg Academic Hospital, Cape Town. Tony Meyers, MB BCh, FCP (SA), FRCP (Lond), is Emeritus Professor of Medicine in the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg, South Africa, and Chairman of the National Kidney Foundation. Errol Gottlich, MB BCh, DCH, FCP Paeds (SA), Cert Nephrol (Paeds) (SA), is a paediatric nephrologist at Morningside Mediclinic, Johannesburg. Sarala Naicker, MB ChB, MRCP (UK), FRCP (Lond), is a member of the Ministerial Advisory Committee on Transplantation and Emeritus Professor of Medicine in the Faculty of Health Sciences, University of the Witwatersrand.

Corresponding author: M R Moosa (rmm@sun.ac.za)

Very few patients with end-stage kidney disease in South Africa receive renal replacement treatment (RRT), despite the rapidly growing demand, because of resource constraints. Nephrologists who agonise daily about who to treat and who not to, and have been doing so since the inception of dialysis in this country, welcomed the opportunity to interact with the National Department of Health at a recent summit of stakeholders. The major challenges were identified and recommendations for short- to long-term solutions were made. While the renal community can still improve efficiencies, it is clear that much of the responsibility for improving access to RRT and reducing inequities must be borne by the national government. The summit marks the first step in a process that we hope will ultimately culminate in universal access to RRT for all South Africans.


Fewer than 5% of all patients with end-stage kidney disease (ESKD) in sub-Saharan Africa receive dialysis, with patients with no access at all.[1] While the situation is somewhat less dire in South Africa (SA), we compare very poorly with countries that are our economic peers (Fig. 1). The recent release of the South African Renal Registry by the South African Renal Society[2] produced data that were so alarming that the National Department of Health (NDoH) convened a national summit to discuss the challenges faced in SA. Delegates to the summit included relevant stakeholders: public and private sector clinicians, healthcare funders, representatives of the pharmaceutical industry and the NDoH, a representative of the World Health Organization (WHO) and representatives of the National Kidney Foundation. The meeting was held in Johannesburg over 2 days in March 2015 and produced recommendations to provide short-, medium- and long-term solutions. Discussions revolved around a few key issues in an attempt to find workable solutions.

Human resources

Chronic kidney disease (CKD) affects 14% of the adult population in sub-Saharan Africa.[3] The vast majority of South Africans who have ESKD die because of lack of access to definitive lifesaving treatment.[4] The major challenge faced by the country is lack of sufficient resources – capital and human – to provide universal access. The reason why SA has lagged so severely behind in the provision of renal replacement treatment (RRT) compared with similar middle-income countries is probably the HIV/AIDS epidemic, which has demanded a disproportionate quantum of the health budget.[4] In addition, there are inequities in the provision of renal services at several levels. Poorer patients and patients in rural areas are underserved as a result of the lack of facilities. In response to RRT being made a minimum prescribed benefit, the private sector facilities have grown by over 3 000% over two decades, but in contrast there has been no significant growth in renal services in the public sector that serves over 80% of the country’s population.[2] The renal community faces a major shortage of skilled personnel and reflects the national skills challenges.[5]

The lack of appropriate and adequate skilled personnel has hampered the development of renal care in SA. Insufficient numbers of personnel are being trained and effective retention strategies are lacking. To address the situation, the summit proposed medium- and long-term strategies. In order to ensure high-quality renal care it was agreed that a nephrologist (or a specialist physician where no nephrologist is available) should be attached to every dialysis unit. SA currently has 1.1 nephrologists per million population (pmp), compared with 6.5 and 4.5 in Egypt and Morocco, respectively – not even comparing ourselves with high-income countries.[6] Additional posts to train more specialist nephrologists were strongly recommended. This would also require an increase in the number of permanent academic hospital posts and a clear retention strategy. A mid-level worker, provisionally identified as a ‘clinical associate’ working under the supervision of a nephrologist, was proposed as an option. The clinical associate would be trained to perform procedures that would obviate the need to transfer patients to the care of a nephrologist, including insertion of dialysis catheters and performing renal biopsies. The role of this associate will need further discussion to ensure that the level of training is matched to the requisite skills level.

Renal nurses form the backbone of any renal replacement programme, but are in short supply. An important approach is to create more training centres and programmes for renal nurses around the country. A way of optimising the use of the limited numbers of renal nurses is to reduce the recommended dialysis staff-to-patient ratio from the current 1:4 to 1:6, as a strategy that would...
although there are limited data to support burnout and reducing the quality of care, do prevail in dialysis units in high-income this may raise some concerns, these ratios be easily and rapidly implemented. While the US National Institutes of Health and the US Renal Data System, and GPI-PC data are from the considerably poorly compared with countries with comparable GNI-PC. The dialysis rates are from the Human Development Reports of the United Nations Development Programme.

Fig. 1. Prevalence rates of dialysis in various countries (pmp) in 2012. The countries are listed in order of increasing gross national income per capita (GNI-PC) in 2012. All countries listed above SA are categorised as high income by the World Bank. SA and those below are upper-middle countries (lighter shade). South Africa’s GNI-PC was USD1 726, compared with USD123 365 and USD6 060 for Qatar and the Philippines, respectively. SA has the lowest reported dialysis rate and with few exceptions fares considerably poorly compared with countries with comparable GNI-PC. The dialysis rates are from the US National Institutes of Health and the US Renal Data System, and GPI-PC data are from the Human Development Reports of the United Nations Development Programme.

be easily and rapidly implemented. This may raise some concerns, these ratios do prevail in dialysis units in high-income countries. The risks are those of greater burnout and reducing the quality of care, although there are limited data to support this as yet. However, with the current generation of dialysis machines equipped with vastly improved technology and safety features, a different level of nursing oversight is required. Reducing the staffing ratio may be an important long-term solution. The summit proposed short- and long-term solutions to improve costs. Developing the new staffing model alluded to above could be an important long-term solution. Other measures that could be instituted almost immediately include tendering for items at a national level to benefit from economies of scale, minimising hospital admissions and stay, ensuring quality dialysis and patient care, and the appropriate use of pharmaceuticals. The summit was cognisant of the fact that a large proportion of our patients are based in rural areas, making Dialysis is expensive, and is conservatively estimated to cost approximately ZAR200 000 per annum per patient. Despite the fact that haemodialysis requires considerably more infrastructure and staff, the cost differential between haemodialysis and peritoneal dialysis is minimal and favours haemodialysis as the cheaper option. The high costs of peritoneal dialysis fluid needs to be interrogated, considering that such fluids are locally produced and are less expensive in countries that use locally sourced products.

The summit also recognised that a successful renal programme required the services of other skilled personnel, including surgeons (trained in fashioning vascular access and placement of peritoneal dialysis catheters) and dialysis technicians (whose scope of practice must be broadened to assist the registered nurses), alongside social workers, dieticians and transplant co-ordinators, among other support staff. Several of these staff could be shared between units in the same region. The shortage of surgeons and limited theatre times to perform the relevant procedures is a major factor compromising patient care; delays in fashioning vascular fistulas mean that prolonged temporary vascular access is required, resulting in severe morbidity and, not infrequently, in preventable deaths.

**Dialysis**

Dialysis is expensive, and is conservatively estimated to cost approximately ZAR200 000 per annum per patient. Despite the fact that haemodialysis requires considerably more infrastructure and staff, the cost differential between haemodialysis and peritoneal dialysis is minimal and favours haemodialysis as the cheaper option. The high costs of peritoneal dialysis fluid needs to be interrogated, considering that such fluids are locally produced and are less expensive in countries that use locally sourced products.

The summit also recognised that a successful renal programme required the services of other skilled personnel, including surgeons (trained in fashioning vascular access and placement of peritoneal dialysis catheters) and dialysis technicians (whose scope of practice must be broadened to assist the registered nurses), alongside social workers, dieticians and transplant co-ordinators, among other support staff. Several of these staff could be shared between units in the same region. The shortage of surgeons and limited theatre times to perform the relevant procedures is a major factor compromising patient care; delays in fashioning vascular fistulas mean that prolonged temporary vascular access is required, resulting in severe morbidity and, not infrequently, in preventable deaths.

**Dialysis**

Dialysis is expensive, and is conservatively estimated to cost approximately ZAR200 000 per annum per patient. Despite the fact that haemodialysis requires considerably more infrastructure and staff, the cost differential between haemodialysis and peritoneal dialysis is minimal and favours haemodialysis as the cheaper option. The high costs of peritoneal dialysis fluid needs to be interrogated, considering that such fluids are locally produced and are less expensive in countries that use locally sourced products. The summit also recognised that a successful renal programme required the services of other skilled personnel, including surgeons (trained in fashioning vascular access and placement of peritoneal dialysis catheters) and dialysis technicians (whose scope of practice must be broadened to assist the registered nurses), alongside social workers, dieticians and transplant co-ordinators, among other support staff. Several of these staff could be shared between units in the same region. The shortage of surgeons and limited theatre times to perform the relevant procedures is a major factor compromising patient care; delays in fashioning vascular fistulas mean that prolonged temporary vascular access is required, resulting in severe morbidity and, not infrequently, in preventable deaths.
ambulatory care difficult. The summit also recommended a ‘peritoneal
dialysis first’ strategy and infrastructure to support this approach.
Several countries have instituted incentives to promote peritoneal
dialysis, including reducing import duties.[16] Greater use of existing
dialysis facilities, which are generally adequate, was also recommended
to allow greater numbers of patients access to treatment; this could be
achieved in an incremental fashion. Since dialysis machines can be
used as often as required, the cost of disposables and lack of personnel
are the main limitations to increasing the use of facilities in the public
sector. Negotiations with the private sector may allow patients access
to dialysis in regions where state facilities are lacking, without a major
outlay by government.

Timely referrals of patients with CKD will improve assessment
of patients, improve preparation for RRT and obviate the need
for acute dialysis (which, in SA, is arguably how the majority of
patients present, only to have the diagnosis of CKD confirmed
subsequently). Late presentations add to costs in several ways:
prolonged hospitalisation, need for temporary vascular access
and more intensive dialysis. Besides the significant economic
impact, late and ultra-late presentations are associated with
poorer patient outcomes, and are potentially avoidable.[11] The
ideal of pre-emptive kidney transplantation would reduce costs
and improve patient outcomes, but remains an elusive goal;
globally only 5% of CKD patients receive transplants without prior
dialysis.[12] Although the summit recognised that while healthcare
providers bear the brunt of the treatment costs, the economic
and psychosocial costs to the patient and his/her family are not
insubstantial. The impact of the disease on the patient’s lifestyle
ability and ability to seek employment and earn has a direct influence
on treatment choices and compliance.

Transplantation

There is no shortage of potential organ donors in SA, as a visit to
any busy trauma unit will confirm – translating these into actual
donors is where our challenge lies. The current transplant rate of
4.7 pmp in SA is woefully inadequate to meet needs and below the
transplant rate of other middle-income countries.[20] The declining
number of kidney transplants is the result of declining numbers of
donations from deceased donors. The summit has recommended
that deceased donation be prioritised. There are several models of
organ donation, of which the Spanish and Croatian models are the
most effective at increasing deceased donor transplantation; the
former has been successfully employed across a diverse range of
countries. The successful models have in common an integrated
approach including legislative changes, centralisation of authority,
employment of transplant co-ordinators responsible for organ
recovery, reimbursement of donor hospitals and public awareness
campaigns.[15] Although countries with an opt-out system have 25 -
30% more donations than countries with required consent, in the
integrated models – that incorporate opt-out systems – the benefits
are of lesser importance. The yield of organs with the integrated
models reduces, or may obviate, the need for non-heart-beating and
extended criteria donors.[13] The current reliance on living donor
transplants is of some concern, as there is recent evidence that in
the long term, altruistic kidney donors may suffer some ill health.[13] New
deceased donor concepts that bear consideration include those of
reciprocity and prioritisation, where persons who previously
registered as donors are prioritised should they require a kidney. This
has led to a dramatically significant increase in donors and transplants
in Israel.[4] The introduction of the Spanish model in Latin America
was less successful, with failure ascribed to scarcity of resources
and, more importantly, the lack of political will.[17] The importance
of the involvement of our NDoH in ensuring the success of such a
programme therefore cannot be over-emphasised. Controversy
surrounds the use of incentives for organ donation. Notably, the
World Medical Association, the WHO and the Convention on
Human Rights and Biomedicine all support compensation for
expenses the living donor may have incurred.[18] The effect of other
measures that have been suggested to increase organ donation
appears to be limited.

There is an urgent need to improve access to RRT for patients
using the public health service in a fair and equitable fashion, and the
summit’s call for ‘250 and 25 by 2025’, which alludes to the plan to
increase dialysis to 250 pmp and kidney transplantation to 25 pmp by
2025 (from 164 and 4, respectively), needs to become a clarion call!

Reducing the burden of kidney disease

The SA government’s National Development Plan – 2030 emphasises
prevention of disease, but to a large extent CKD is the end result of
a much larger health challenge facing our country. Diseases such
as hypertension, diabetes mellitus, and a lesser extent infections
and acute kidney injury lead to CKD. These diseases need to be
appropriately managed to reduce the risk of the development of
CKD. Diabetes mellitus will increase by 88% between 2012 and 2030
in sub-Saharan Africa, and hypertension by 70% between 2008 and
2025.[20] The diabetes mellitus epidemic is driven by our sedentary
lifestyle and poor nutritional choices that contribute to one of the
largest health challenges facing our society – obesity. Almost 70%
of SA women are overweight or obese; of even greater concern is
that over 25% of girls are also overweight or obese.[20] Managing
the lifestyle diseases will ultimately have a beneficial effect on CKD.
Community-based screening for CKD is not cost-effective, but high-
risk patients – mainly those with diabetes and hypertension – would
benefit from strategies that reduce the risk of developing, and retard
progression to, ESKD. Such an initiative could be driven by health
workers in primary care.

In closing

Each week, the equivalent of two planeloads of SA lives are lost
because of lack of access to RRT. This appalling situation is steadily
getting worse. Appeals from clinicians to health authorities for
greater access to treatment have been met with the usual refrain
that resources are insufficient – an explanation that is particularly
disappointing in face of funds being diverted from the national fiscus
to a range of expenditures that benefit the citizenry not at all.

We are presenting the NDoH with a well-considered and workable
blueprint for addressing the crisis of CKD and its treatment. As
patient advocates who have to manage the crisis, we challenge the
government to work with us to improve care for patients with CKD.
Every time one of our patients dies, it is an indictment on us all.

Acknowledgements. We gratefully acknowledge the valuable
contributions made by all the participants of the Ministerial NDoH
Summit, as well as those of Prof. Melvyn Freeman and his team (for
organising the event), Prof. Yusuf Veriava for his leadership in the process,
and Prof. Charles Swanepoel for his critical review of this article.

References

4. Pevelin S, Benatar SR, Fleischer T. Improving resource allocation decisions for health and HIV


Accepted 28 September 2015.