

Haemodialysis Practice in Sierra Leone – A call for urgent action

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ABSTRACT

The rising burden of chronic kidney disease is approaching epidemic proportions. This has led to escalated deaths as well as morbidity resulting from CKD. In Sierra Leone, the provision of sustained haemodialysis commenced in December 2016. In this article, we described how it all started, the patient characteristics, the progress made so far as well as the challenges impeding the smooth delivery of this service to the nation. We have made a few recommendations including the need for funding and support in terms of training of staff by the Government of Sierra Leone, private organizations and international partners like WHO or World Bank.

INTRODUCTION

Chronic kidney disease (CKD) is an emerging global public health problem¹. Globally, there is an increase in the burden of CKD both in developed as well as developing countries.² However, the greatest impact of this rise is felt in developing countries where patients present late and lack the financial resources needed to take care of the myriad of problems associated with CKD^{2,3}.

The enormous cost of care of patients with advanced CKD is taking its toll on health care budgets in developed countries and is contributing immensely to morbidity and mortality in developing countries³. In the developed world, CKD affects mainly older adults and has a huge impact on the health budget of

those nations³. In sub-Saharan Africa, it affects mainly young adults (20-50 years old), increases morbidity and mortality among this age group and limits their economic productivity³. Factors contributing to this negative scenario include late presentation, limited kidney replacement therapy and its unaffordability, absence of kidney disease prevention programs and poor literacy level³. The major causes of CKD in this young age group were hypertension and infection-related chronic glomerulonephritis³.

Sierra Leone is located on the west coast of Africa, divided into 4 regions, with a population of about 7 million persons. There is paucity of data on the burden of CKD in Sierra Leone. However, using Nigeria in sub-Saharan Africa as a prototype, CKD accounts for 8-10% of hospital admissions⁴. This may be an underestimation as a good number of CKD patients remain undiagnosed, or may seek traditional or spiritual healing⁴. Studies done in other countries in sub-Saharan Africa reported 2- 5% of medical admissions in tertiary hospitals in South Africa and Ghana^{5,6}.

In Sierra Leone, sustained renal replacement therapy in the form of haemodialysis was commenced at Connaught Hospital on 23rd December 2016 following the establishment of a dialysis unit in the hospital. This was achieved by the help of the Israeli Government through its Ministry of Foreign Affairs. The purpose of this article is to describe our experience with haemodialysis treatment in Sierra

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Leone, in terms of patient characteristics, progress made, challenges encountered, staffing and other outputs.

How did it all start?

The former first lady of Sierra Leone, Mrs Sia Nyama Koromamade a formal request to the Israeli Government through the Israeli ambassador in the country to help in establishing dialysis treatment in the country. In February 2012, Connaught Hospital received four haemodialysis machines donated by the Israeli Ministry of Foreign Affairs. However, sustained haemodialysis treatment was not achieved due to problems with the water treatment plant and lack of consumables needed to make the unit functional. By March 2013, rehabilitation of the unit was done, recruitment and training of dialysis nurses and technical support team was put in place. However, this attempt to reactivate dialysis service was truncated by the Ebola outbreak in 2014. In December 2016, a medical team from Israel came and installed the water treatment plant and sustained dialysis treatment was commenced in Sierra Leone.

Staffing

Presently, the unit is staffed with 2 nephrologists, 11 dialysis nurses and 2 dialysis technicians. There is need for regular training and retraining of staff.

Clinical profile of dialysis patients

The clinical profile of patients who received haemodialysis treatment at the Dialysis Unit of Connaught Hospital, University of Sierra Leone Teaching Hospitals' Complex while it was operational (December 2016 – June 2018) was described retrospectively. A research proforma was designed and used to extract information regarding the age and gender distribution, period of admission, type of renal disease (acute or chronic), aetiology of renal disease, vascular access and outcome of patients from their dialysis records.

A total of 152 patients received treatment at the unit, twelve (12) of these patients lived abroad, 98 (64%) were males while 54 (36%) were females. A total of 1360 treatment sessions were delivered. The majority of patients 82 (54.2%) were within the age range 36-55 years. A smaller proportion of

patients 39 (25.3%) were within the age range 0-35 years and 21(20.5%) were within the age range 66-85 years. Out of the 152 patients, 140(92.1%) patients were in end stage renal disease (ESRD), while 12(7.9%) patients had acute kidney injury (AKI). The average duration of hospital stay for patients on haemodialysis was 6-8 weeks. The commonest vascular access in our patients was femoral catheters 115 (75.6%), 31(20.4%) were having dialysis via an arteriovenous fistula, 6(3.9%) with subclavian or jugular venous access. The most common disease underlying disease of CKD was hypertension (56.6%) and diabetes mellitus (9.6%); chronic glomerulonephritis, HIV, adult polycystic kidney disease lupus nephritis, sickle cell nephropathy, eclampsia and Hodgkin's lymphoma accounted for the remaining 33.8%. The commonest underlying aetiology of acute kidney injury was sepsis (21.7%). Many of our patients were unable to sustain haemodialysis for more than 3-6 months. A total of 40(26.3%) of patients, males(19) and females(21) died while the center was operational.

The male preponderance among this cohort of patients may be explained by differences in health-seeking behavior between the sexes as males tend to have financial independence and better health seeking behavior. This trend is also seen in studies done in Spain and United States of America showed a percentage male preponderance of 60.1% and 61.2% respectively^{7,8}. A study done in Nigeriashowed a male preponderance of 65.3%⁴. Many of our patients on dialysis are in their young productive years, thus depriving them and the country of their economic contribution and livelihood. A study done in Nigeria suggests a similar age distribution pattern among their dialysis population with high rate of job loss among this population⁹. This results in untold economic hardship, loss of human resource and poor compliance with dialysis treatment schedules due to financial constraints^{10,11}. The out of pocket payment and lack of medical insurance makes it worse for patients to cope with prolonged haemodialysis.

Many of our patients were unable to sustain the cost of dialysis treatment at \$100 per session. At current exchange rates, this is about one million, one hundred thousand Leones (our local currency). This high cost and unaffordability of dialysis may account for early death among our patients. The sustainability of maintenance haemodialysis is poor in most developing countries and kidney transplantation, which

is also unaffordable, is rarely performed^{12,13}. The management of patients with end stage kidney disease in low and middle income countries is too expensive such that most governments are unable to afford, resources and budgets that are allocated are unable to meet the burden of treatment¹⁴. Considering the poverty and literacy levels of our population, this cost is unaffordable to most Sierra Leoneans¹⁵. A study done in Northern Nigeria, highlighted that unaffordability and late presentation aggravates the dismal prognosis of patients on haemodialysis¹⁶.

The commonest cause of end stage kidney disease in our dialysis population was systemic hypertension. This finding is prevalent in sub-Saharan Africa as reported by Arogundade *et al*³. This may be due to poor health-seeking behavior, high salt diet and poor compliance to antihypertensives among our population.

Majority of our dialysis population initiate and to some extent sustain haemodialysis with a femoral catheter. This may be due to late presentation, lack of access to vascular surgeon for arteriovenous fistula creation or restricted access and inability to afford tunneled catheters. Presently, we do not have a vascular surgeon in Sierra Leone and tunnel catheters are not available in the country. A few patients with fistula benefitted from an Israeli vascular surgeon who fashioned it during a short visit to Sierra Leone. Those with tunnel catheters procured them from Nigeria or neighbouring Guinea. The native arteriovenous fistula (AVF) is the first choice vascular access for chronic haemodialysis patients¹⁷. This is because of the thrombotic and infectious complications more frequently associated with arteriovenous graft and central venous catheters¹⁷. The risk for mortality is lower in fistula users than catheter users as catheter use were associated with 80–134 additional deaths per 1000 person-years compared with AVF use¹⁸.

Progress made so far

While the unit was operational, patients within the country were able to access haemodialysis treatment with relative ease. Also, Sierra Leoneans abroad with end stage kidney disease were able to visit home and continue their haemodialysis treatment. With the breakdown of the Connaught Hospital dialysis unit, many patients with dialysis-requiring renal disease may have died except for the timely intervention of a

Sierra Leonean who decided to urgently convert his home haemodialysis facility for public use to save the dying populace of kidney patients requiring dialysis. Later, this private facility was upgraded into a fully functional private dialysis center. As at now, this is the only facility offering haemodialysis in the country.

What are the challenges?

The challenges faced in ensuring the effective delivery of this treatment modality include unavailability of dialysis machines, consumables and permanent catheters or personnel who can create arteriovenous (AV) fistulas needed for haemodialysis. The maintenance of the haemodialysis machines was also a major challenge as parts are not available in the country and technical personnel are not in the country. There is need for strong laboratory support to the unit. The drugs needed by patients on haemodialysis like erythropoietin, iron sucrose, calcium carbonate or alpha-calcitriol are either unavailable or too expensive for patients to buy.

Also, many of our patients were unable to pay for dialysis treatment over a long period of time. While the center was operational, a session of haemodialysis cost \$100 which many patients were unable to afford. There is a need for increase support to this group of patients from both governmental and non-governmental sources (locally as well as internationally). In Senegal, both haemodialysis and peritoneal dialysis are free as this is borne by the government, although patients pay for drugs which may be needed during the dialysis procedure¹⁹. There is also need for improved access to haemodialysis with availability of centers in every province or district in the country.

Recommendations

We recommend that systems and structures are put in place to ensure the smooth delivery of haemodialysis treatment by the Government of Sierra Leone (GoSL). Funding should be provided for training of staff working at the dialysis unit by GoSL and their partners. Renal replacement therapy should be made accessible and affordable and there is an urgent need for kidney disease prevention programs to be supported by Government or private organizations. Building a strong medical insurance scheme for health

workers and the general populace as well as implementing public-private partnerships are possible solutions to these problems among many others. There is an urgent need for international donors like World Bank, World Health Organization and UNICEF to help out.

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