

Income Distribution and Sources of Funding for Maintenance Haemodialysis of Patients in the University of Port Harcourt Teaching Hospital

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ABSTRACT

End stage renal disease (ESRD) is prevalent in Nigeria, with attendant high morbidity and mortality rates. In Nigeria, there have been reports of low affordability of haemodialysis and dialysis inadequacy. There is however, no formal study of the sources of funding for dialysis in the country. Such studies when replicated across the country will provide an evidence based tool with which to engage Government on the need for a Government driven ESRD program. A prospective direct questionnaire based study of End stage renal disease patients receiving maintenance haemodialysis was conducted at the University of Port Harcourt teaching hospital. Twenty four (24) males and 16 females (M/F=1.4:1) were studied, with mean age of 40.62 ± 14.9 years, mean e-GFR, 6.53 ± 1.6 ml/min. and mean duration on dialysis of 5.03 ± 1.6 (3-12) months. The mean annual income of the patients was N1, 147, 172.02 (N60, 000.00 to N3,200,000.00). The estimated annual cost of haemodialysis in Port Harcourt per patient is N2,340,000.00. Sixty (60) percent of the patients earned below one million naira per annum. Only 10 percent of the patients earned over 3 million naira p.a. The annual incomes of 62.5% of the patients were less than fifty percent the annual cost of dialysis. Annual incomes showed positive correlation with the duration on dialysis ($r = +0.14$) and number of dialysis sessions received ($r = +0.3$).

Dialysis was funded from family income in 65 percent of the cases. Funding was from extended family members in 17.5% and philanthropic sources in 10% of cases. There was no Government support to any patient or funding through insurance. The annual incomes of the great majority of ESRD patients are less than 50 percent of the annual cost of maintenance haemodialysis and cannot sustain optimal long term haemodialysis. A Government driven ESRD Care program is therefore inevitable in the country if we are to improve access to haemodialysis.

Keywords: *Income distribution, source of funding, maintenance haemodialysis, University of Port Harcourt teaching hospital*

INTRODUCTION

The burden of suffering for the end stage renal disease (ESRD) patient is enormous. It includes the clinical burden of life-long uraemia and its related complications, lowered quality of life, job losses and particularly the huge financial burden of cost of medical care [1,2]. The financial burden for caring for these patients in the United states runs into billions of dollars each year [3,4].

It was in realization of this huge financial burden on the patient and their families and the fact that only very few Americans could foot the bill, that the US Legislature passed the Medicare End Stage Renal Disease (ESRD) programme into law in 1973.

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Ever since, the US government had virtually taken over the financial burden of care from the patients and their families.

In virtually all other developed countries such as Canada, the United Kingdom, and other European countries, similar schemes [6, 7] exist with local variations for the care of ESRD patients.

Nigeria, the sixth major petroleum producing country in the world, with a population of about 140 million people and chronic kidney failure medical admissions rate of 1.6-8 percent [8, 9] has no organized renal care service.

Though, it is common knowledge that the majority of ESRD patients in Nigeria cannot support long term dialysis, there is no factual documentation of this observation. Two previous attempts [10,11] in highlighting this problem did not give details of patients actual incomes relative to average cost of dialysis. Similarly, there has been no previous systematic study of the sources of funds for dialysis by ESRD patients. The availability of such evidence based information would serve as a useful bargaining tool to convince health policy decision makers of the need for Government intervention in ESRD care in Nigeria.

This study is therefore undertaken to determine the income distribution and the sources of funding for maintenance haemodialysis among ESRD patients in the University of Port Harcourt Teaching Hospital.

METHODS

The data for analysis was obtained with aid of a purpose designed semi-structured questionnaire applied to patients undergoing maintenance haemodialysis at the University of Port Harcourt Teaching Hospital during the period of study.

The questionnaire was applied to the patients by direct interview. Medical registrars and house officers on clinical attachments in the haemodialysis unit served as the interviewers, after training by the investigators.

All consecutive ESRD patients undergoing maintenance haemodialysis in our service, who satisfied the inclusion criteria during the period January to June 2009, were included in the study.

Inclusion criteria:

1. Patient must be a confirmed case of end stage renal disease (ESRD) in accordance with the NKF/KDOQI [12] guidelines for diagnosis and staging of CKD.

2. Patient must have been undergoing maintenance dialysis in our centre for an uninterrupted minimum of three months prior to recruitment.

Information obtained with the questionnaire include: the bio-data and basic clinical data of the patient which were obtained from the patients clinical records.

Relevant clinical data obtained include the primary renal diagnosis, the estimated glomerular filtration rate (e-GFR) at first presentation, the duration of the patient on dialysis in months, and the number of dialysis sessions per week attained by the patient.

The data pertaining to the income status and sources of funding for dialysis include the following: educational status, occupation, nature of work, average monthly income, average annual income, family size. Others include sources of funds for payment for dialysis treatment. The options include: personal, family sources, extended family sources, employers, insurance payments, philanthropic organizations, philanthropic individuals and any other sources.

Patients were grouped into six socio-economic classes in accordance with the Registrar General classification of occupations [13] as follows- Class I (top government and corporate executives), Class II (upper middle level executives, professional class), Class III (middle level executives), Class IV (clerical cadre, skilled technicians.), Class V (semi-skilled artisans), Class VI (unskilled).

Where the patient is a minor or a dependant (e.g child, student or house wife) the income of the bread winner of the family is taken as the income of the patient. For patients who are not on fixed paid incomes, they were requested to give an estimate of how much income they earned in a day, week or a month which was extrapolated to derive the annual income.

In other to determine the relativity between the income of the patients and the annual cost of dialyzing hypothetical ideal patient in the Port Harcourt environs, the annual incomes of the patients was calculated as a percentage of the annual cost of dialysis for an ideal patient dialyzing three times a week in the Port Harcourt and South- south states of Nigeria.

The cost of a one 4hr-session of haemodialysis in this region, range from ₦15, 000.00 to ₦25, 000.00 (in public and private dialysis facilities). Using the

lowest amount of ₦15,000 .0 per session as a benchmark, the annual cost of haemodialysis for one year comes to N2,340,000.00 a year for an ideal patient dialyzing three times a week.

Data Management

The data were analyzed with Epi- info versions 6.0 statistical package. Quantitative variables are presented as mean ± standard deviation. Student t-test was used to compare quantitative variables with significant levels (p) set at 0.05. Pearson correlation coefficient was used to determine the relationship between dependent variables. Tables are used as appropriate.

RESULTS

A total of forty patients were studied, 24 males and 16 females with a sex ratio of 1.4:1 were studied. Their ages ranged from 14 to 69 years with a mean age of 40.62 ± 14.9 years. Twenty six (65%) were married, 10(25%) were single, 2(5%) were a widow and a widower while 2(5%) were teenagers.

Twenty one (52.5%) had tertiary education, 12(30%) had secondary education only, 6(15. %) had primary education only and 1(2.5%) had no formal education. The family size ranged from 1 to 12, with a mean of 6.1 ± 2.9. The 6-8 family- size groups was more predominant, responsible for 45% of the patients.

The distribution of the primary cause of CKD as obtained from the clinical case records were, chronic glomerulopathy(45%),hypertensive nephropathy(25%),diabetic nephropathy(12.5%), autosomal dominant polycystic kidney disease(5%), nephrotic syndrome(5%),obstructive uropathy(5%) and suspected substance abuse induced nephropathy (2.5%). Their e-GFR ranged from 3.6-10.6 mls/min. with a mean of 6.53 + 1.6 ml/min.

The patients have been on maintenance dialysis for a period ranging from 3 to 12 months with a mean of 5.03 ± 1.6 months. The mean number of dialysis sessions per week attained was 1.4 + 0.6 [1-3] sessions per week.

Socio Economic and Income Distribution

By socio-economic grouping, they were, Class I - 3(7.5%), Class II - 8(20%), Class -III 8(20.0%), Class IV -9(22.5%), Class V- 8 (20%) and Class VI- 4(10%) respectively.

The annual incomes of the patients ranged from 60,000.0 to 4,200,000 naira (428.6-30,000 US-dollars) with a mean of 1,280,292.0 ± 1,147,122.02.(9,144.9us-dollars).

Table 1 shows the annual income distribution of the patients according to socio-economic status. Patients belonging to socio-economic class I earned an average of 4 million naira p.a. while those in the

Table 1: Distribution of annual incomes according to socio-economic class

Socio-economic class	Mean annual income	Range. (Million naira)
Class I	4million	3.6-4.2
Class II	2.1m	1.2-3.0m
ClassIII	1.1m	0.6-2.4
Class IV	0.74m	0.36-1.2m
Class V	0.34m	0.12-0.96m
Class VI	0.37m	0.06-1.0

socioeconomic class VI earned an average of 0.37million naira p.a. Table 2 shows the spatial distribution of the annual incomes. Families with

Table 2: Spatial distribution of family income

Annual income. (million naira)	Number	Percentage
Less than 0.5	11	27.5
0.5-0.99	13	32.5
1.0-1.49	6	15.0
1.5-1.99	2	5.0
2.0-2.49	2	5.0
2.5-2.99	2	5.0
3.0m and above	4	10.0
Total	40	100.0

annual incomes less than 0.5million naira(27.5%) and 0.5 to 0.99 million naira (32.5%) i.e those earning less than one million naira p.a. constitute 60 percent of the patients. Those earning 1 to 1.49 million

constituted 15% of the patients. The three groups above together constitute 75percent of the patients. Thus seventy-five percent of the patients earned less than 1.5 million naira p.a. Only 10 percent of the patients earned 3 million naira p.a. and above.

Of the four patients that earned 3 million naira and above, three worked with major petroleum companies while the remaining one was a permanent secretary in a state government service. Annual incomes showed positive correlation with the duration of the patients on dialysis($r= +0.14$) as well as with the number of dialysis sessions attained per week($r =+0.3$).

Table 3 shows the annual incomes of the patients as a percentage of the annual cost of dialysis in the Port Harcourt area. In 52.5% of the patients

Table 3: Family income as a percentage of *Annual cost of dialysis.for an ideal patient. (3 dialysis sessions per week)

Family income as a percentage of Annual cost of dialysis for ideal patient	Number	Percentage
≤ 25%	12	30.0
26-50	13	32.5
51-75	7	17.5
76-100	2	5.0
>100	6	15.0
	40	100

**Calculated Annual cost of dialysis for an ideal patient, based on bench mark of N15,000.0 per dialysis session at three dialysis sessions per week = ₦2,340,000.0.*

their annual incomes are less than 50% the annual cost of dialysis for an ideal patient. Only 15 percent of the patients earned annual incomes either equal or higher than the annual cost of dialysis in the area.

Sources of Funding

The sources of funding for dialysis are set out in table 4. Twenty-six patients (65%) paid for their dialysis treatment from personal / immediate family income. Support from extended family sources was obtained in 17.5% of the patients. Thus 82.5 percent

Table 4: Sources of funding for Haemodialysis treatment

Source of funding.	Number	Percentage
Direct family income	26	65.0
Extended family source	7	17.5
Employer support	3	7.5
Philanthropic organization	3	7.5
Philanthropic individual	1	2.5
Insurance payments	Nil	0.0
Government support	Nil	0.0
TOTAL	40	100.0

of the patient funded their treatment from immediate and extended family sources.

Four patients (10%) received support from philanthropic sources. One was from a philanthropic individual and three from religious organizations. None of the patients obtained financial support from either insurance payments or from Government.

DISCUSSION

This study provides an objective data that clearly shows the wide gap between the incomes of maintenance dialysis patients and the actual amount required to obtain optimal dialysis. Two previous works [10, 11] in this direction did not study details of patients' income profiles.

Although there was some spread in the distribution of the patients by socio-economic stratification, there is a wide disparity in income distribution (table 1). Sixty percent of the patients do not earn up to 1 million naira p.a. The 10 percent of the patients who earned 3 million naira and above represent the privileged few in the Nigerian society working for big oil conglomerates or top Government officials.

The annual income of 52.5% of the patients was less than fifty percent of the annual cost of dialysis in the region. Only 15 percent of the patients have annual incomes equivalent to or exceeding the annual cost of dialysis.

For those in the low income groups achieving optimal dialysis is simply not feasible. For those in the high income groups, achieving optimal dialysis implies that they have to deploy all their annual

earnings to pay for dialysis at the detriment of medications, erythropoietin, other competing family financial needs, such as feeding, children education, etc. The significance of these findings is that, at the prevailing income levels, virtually none of the patients, including those in the high socio-economic brackets can afford to fund optimal dialysis for long term survival and reasonable quality of life.

This inability to fund dialysis is the dominant factor responsible for the grossly sub-optimal dialysis, as reflected by the mean weekly dialysis frequency of 1.4/week attained by the patients. Dialysis inadequacy is a strong risk factor of poor dialysis outcomes, morbidity and early mortality [14,15].

This situation would most likely explain the earlier observations from dialysis centers across Nigeria of very poor dialysis outcomes. These include high drop out rates, high morbidity rates, poor quality of life and unacceptably high mortality rates of over 80 percent within three months of commencement of maintenance dialysis. [16, 17]

With the exception of very minimal support from philanthropic organization, (mainly religious organizations and one philanthropic individual), patients sourced their funds for dialysis almost entirely from family sources which is grossly inadequate and unsustainable as shown earlier. Significantly no form of government support was available to any of the patients. Similarly none of the patients was covered by medical insurance and this may be because presently the Nigerian National health insurance scheme (NHIS) does not cover for dialysis treatment.

This state of affairs as highlighted above led to the advocacy of early kidney transplantation of ESRD patients in Nigeria, leading to the emergence of a few kidney transplant centers in Nigeria, in the last ten years[18-20]. While this option is reasonable, the presence of an effective, accessible and affordable dialysis service remains critical for ESRD care in any country. ESRD patients requiring transplant will need optimization of dialysis before the transplant. In the event of graft failure, the patients will recourse back to dialysis, while awaiting another transplant. Patients for whom transplant is not feasible will depend on dialysis for survival. Therefore, the imperative for an accessible, affordable and sustainable dialysis system in a country is not in doubt.

Poor dialysis outcomes on account of lack of access was the scenario in the United States of America before 1973 that led to subsequent legislation that enabled the establishment of the Medicare-ESRD program[3,4].

Nigeria as a democratic nation subscribes to the United Nations charter on fundamental human rights. The right to life is fundamental. It provides that no person should be allowed to die of an illness for which treatment is available, on account of inability to pay for such treatment. It is the responsibility of Government to ensure that ESRD patients are given the chance to live in Nigeria as in the developed countries of the world.

A Government driven ESRD program in Nigeria is feasible. Such a program can be articulated and funded through a compulsory contributory Health tax regime, involving Government, (e.g. 0.05% of petroleum and gas revenues can be dedicated for this), the major oil companies and conglomerates, all public servants, and all gainfully employed ratable adults. Of course patients and their families will also make some contributions through capitation payments, once the diagnosis is confirmed and patient registered into the program. In this way the financial burden of care is shared by all.

Such an arrangement will within a short period yield huge amounts of funds as is the experience with the National Health Insurance scheme (NHIS), National pension fund (NPF) and the Education Trust fund (ETF) schemes in Nigeria. It may even be possible to accommodate some other chronic health disorders such as cancer care in the program.

What is important is to put in place mechanisms to ensure long term sustainability by ensuring efficient and effective administration, and regular audit of the process to prevent abuses. In other to actualize this will certainly require the appropriate legislation. The Nigerian association of Nephrology (NAN) and the Federal Ministry of health, should lead the campaign to articulate a professional-private bill to the National assembly for a legislation for the establishment of Renal care program for the country. This will however require a great deal of preparatory work to be equipped with factual data on all aspects of CKD and ESRD in the country.

CONCLUSION

The study has provided evidence based data on the prevailing economic deprivation state among the majority of ESRD patients in Nigeria, and confirmed the fact that ESRD patients in Nigeria (including the high income group) cannot afford to pay for renal replacement therapy.

The findings demonstrates the strong need for a Government driven ESRD care program for the country, as the only way to achieve standard best practices in ESRD care in Nigeria, thereby reducing the prevailing and unacceptably high mortality rates associated with ESRD in Nigeria.

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