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Haemodialysis At Enugu State University Teaching Hospital Enugu Nigeria: 1st Year Experience

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ABSTRACT

Renal replacement therapy plays a key role in the management of patients with kidney failure. In most economically disadvantaged nations including Nigeria, haemodialysis is the most available renal replacement therapy. Haemodialysis center was started at Enugu state university teaching hospital on 1st March 2016. The objective of the study is to analyze the activity of the center during the first year of its establishment. This is a retrospective cross sectional study. All the patients that were treated at the center from 1st March 2016 to 28th February 2017 were recruited for the study. Their clinical and laboratory data pre, intra and post-dialysis were entered into a spread sheet and analyzed using SPSS statistical package. A total of 108 patients were dialyzed with a male: female ratio of 1.5:1. The mean age was 46.2±18.1 years, most of the patients were Ibos and of low/middle socioeconomic status. The mean PCV was 22±0.037%, mean serum sodium was 129.8±8.6mmol/l, mean serum potassium was 4.9±0.10mmol/l, mean serum urea was 24.8±12.9mmol/l, and mean serum creatinine was 913.8±424.7umol/l. The month of March had the least(32) sessions of haemodialysis and September had the highest (66)number of sessions. 84.3% had haemodialysis for less than a month and only 4.8% had haemodialysis for at least 6 months. Majority of the patients (67%) had less than 5 sessions of haemodialysis. One (0.9%) patient and 5 (4.8%) patients used ateriovenous fistula and internal jugular catheter as vascular access respectively; others used femoral vein vascular access. Infection, hypertension, hypotension and bleeding were the common complications. One year operation of the haemodialysis at Enugu state university teaching hospital was remarkable; however patients were unable to sustain haemodialysis.

Key words: Haemodialysis, sessions, access, kidney, failure

INTRODUCTION

Haemodialysis plays a key role in the management of patients with kidney failure. It is the most commonly used renal replacement therapy in most kidney care centers globally especially in resource poor nations (Pozo et al. 2012, Ulasi et al. 2010). This emanates from its being more readily available and affordable than the other modalities of renal replacement therapy. Peritoneal dialysis fluid is imported into the country and thus very expensive in patients requiring chronic dialysis, facility and skill for kidney transplant is limited in the country.

Haemodialysis which started in Nigeria more than 30 years ago has impacted positively on management of patients with kidney disease in the country. Hitherto diagnosis of kidney failure was usually synonymous with death as most patients dies shortly after diagnosis. With the advent of haemodialysis in the country, there has been improvement in the prognosis of acute kidney failure and long term survival of patients with chronic kidney failure (Daugirdas et al. 2007).

Kidney failure constitutes a significant proportion of patients presenting to hospitals in Nigeria (Ezeala-Adikaibe et al. 2014). These patients present late to hospitals and usually with features requiring dialytic intervention. There are more than 100 haemodialysis centers across the country with majority of them located in urban areas. Cost of haemodialysis is borne directly by the patients because of lack of governmental or nongovernmental program to subsidize the cost of haemodialysis. This contributes to poor sustenance of regular haemodialysis by the patients in Nigeria (Ulasi et al. 2010; Okafor et al. 2012).

The objective of this study is to analyze the activity of haemodialysis center at Enugu state university teaching hospital Enugu Nigeria one year after inception.

MATERIAL AND METHOD

Study design:

This is a retrospective study. The study was at Enugu State University Teaching Hospital (ESUTH) Parklane Enugu. This 400 bedded hospital was initially designed as a general hospital and subsequently upgraded to a teaching hospital in 2006. It is a multispecialty centre and offers undergraduate and postgraduate programs in medicine, nursing, midwifery and various specialties in medicine. The hospital is a referral center, with referrals from many hospitals within and outside the south east zone of the country.

Study Setting:

The haemodialysis unit was established by the hospital and started operation on 1st March 2016 It has 5 NIKISSO DB007 machines and water treatment unit. The water, electricity and the laboratory facilities were provided by the hospital. The personnel of the unit include: 6 nurses, 2 attendants, 2 potters, a technician, a resident doctor and a nephrologist. Patients were referred to the unit from various clinical departments of the hospital and other hospitals within and outside Enugu State.

On first presentation the procedure was explained to each of the patient; brief history and physical examination was conducted on each patient. Blood sample was collected from the patient for electrolyte, urea and creatinine, packed cell volume, HIV, hepatitis B surface antigen & hepatitis C antibody. Patients seropositive to either hepatitis B or C were not dialyzed at the center because there was no facility dedicated to these patients. Patients were usually assessed clinically and only PCV was done before subsequent haemodialysis. Random blood sugar (RBS) was usually assessed for patients with diabetes mellitus. Severely anemic patients with PCV less than 20% were transfused with packed red blood cell. Patients were advised to skip the dose of the medication before haemodialysis unless those with poorly controlled blood pressure.

Four (4) haemodialysis machines were used by patients that were seronegative to HIV and hepatitis B or C virus, and a machine was used by HIV seropositive patients.

Procedure:

The study population was patients that had haemodialysis at the unit from 1st March 2016 to 28th February 2017. The study was approved by the ethical committee of the hospital.

The data of the patients including the biodata, clinical details, details of the dialysis and the outcome were obtained from the patient's hospital record.

Statistical Analysis:

The data obtained was entered into a spread sheet and analyzed using statistical package for social sciences version 17 (IBM NY). The data were presented as frequencies, means, median, range, standard deviation and proportions.

RESULT

A total of 108 patients were dialyzed during the period. Males were 59.3%(64) with a male : female ratio of 1.5:1. The age range was 3 to 83 years with a mean of 46.2±18.1 years. The age and sex distribution is as in table1.

Table 1. Age and sex distribution

Age range	M-n(%)	F-n(%)	Total-n(%)
< 20	2(1.9)	2(1.8)	4(3.7)
20-39	24(22.2)	19(17.6)	43(39.8)
40-59	18(16.7)	16(14.8)	34(31.5)
60/above	20(18.5)	7(6.5)	27(25)
Total	64(59.3)	44(41.7)	108(100)

All the patients were Nigerians, Christians and 98.1% were Ibos. Traders, students and civil servant constitute 84% of the patients (fig 1).

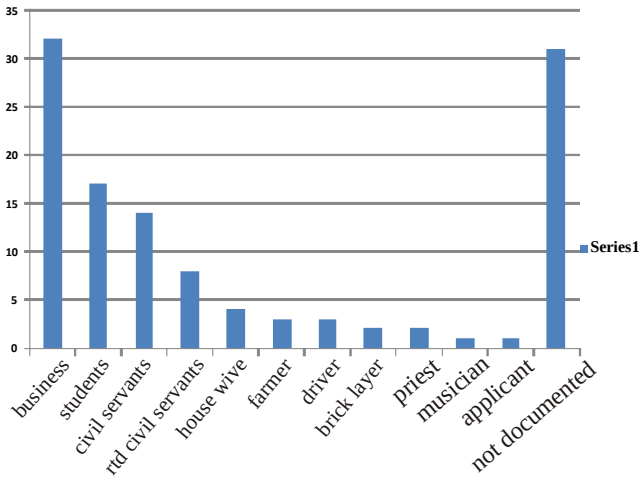

Figure 1: Occupation

The cause of kidney disease was not documented in about 50% of patients; however 16 and 41 patients had acute kidney injury and chronic kidney disease respectively. Twenty two patients (20.4%) were HIV seropositive.

The laboratory parameters showed mean packed cell volume (PCV) 22±0.037% (Range: 8 – 31%), mean plasma sodium 129.8±8.6 (Range: 113 – 148) mmol/l, mean serum potassium was 4.9±0.10 (Range 3.2 – 6.5) mmol/l, mean serum urea 24.8±12.9 (Range: 3.8 – 53.6) mmol/l, serum creatinine 913.8±424.7 (Range: 59 – 2073.8) umol/l.

The months of June and September had the highest number (12) of new patients while the months of April, November and January had the least number of new patients (5). The details of monthly incidence are in figure 2.

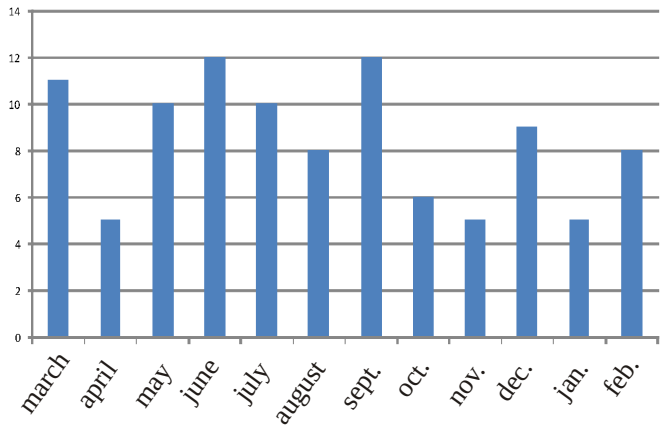

Figure 2: Monthly Incidence.

The total monthly sessions of haemodialysis is as documented in figure 3. The highest (66) and the least (32) number of sessions were in the months of January and March respectively.

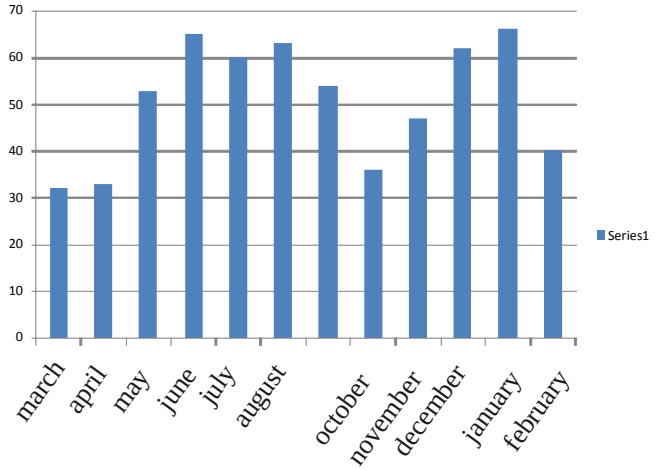

Figure 3: Total Monthly Sessions

Ninety-one patients (84.3%) sustained haemodialysis for less than a month and 5(4.6%)patients sustained haemdialysis for about 6 months. Details as in figure 4.

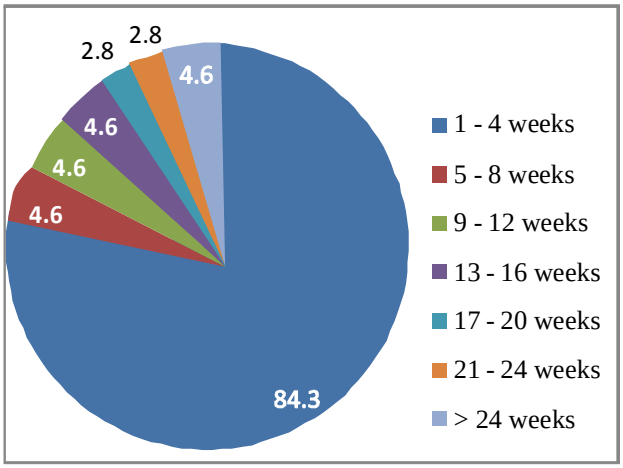

Figure 4: Duration of dialysis

About 67% of the patients had a total of less than 5 sessions of haemodialysis. The total number of haemodialysis sessions by patients is as highlighted in table 2.

Table 2: Numbers of HD sessions per patient

No of sessions	No of patients	percent
1–4	72	66.7
5-8	14	13
9-12	12	11.1
13–16	5	4.6
17-20	1	0.9
21 & above	4	3.7
Total	**108**	**100**

Ultrafiltration was done in 98 patients with mean volume of 2 liters with a range of 0.5 to 5 liters. Only 7(6.5%) patients didn't require ultafiltration during the period studied.

One hundred and three (94.3%) patients used femoral vein catheter, 5 internal jugular catheter and 1(0.9%) patient used atriovenous fistula as vascular access.

Complications

The common complications encountered included bleeding, infection, hypotension, hypoglycaemia and hypertension. The detail of complications is as documented in table 3.

Table 3: Complications of Haemodialysis

• Rigors/chills	• Thrombosis– line
• Hypotension	• Deep vein thrombosis
• Hypertension	• Haematoma – access
• Bleeding	• Failed canulation
• Cellulitis-access	• Dislocated catheter
• Infection –access	• Tachycardia
• Hypoglycemia	? supraventricular

DISCUSSION

Kidney diseases in resource poor nations including Nigeria has been reported to be more prevalent in the males, young adult and middle/low socioeconomic status (Afolabi et al 2009; Ulasi and Ijoma, 2010). Though this study may not be true representation of the population prevalence of kidney diseases, however the result is consistent with the aforementioned reports. This could be that the patients in this study are part of the kidney population and thus there is high probability that it is a good representation of the kidney population. This is also consistent with previous report on patients on haemodialysis in Nigeria (Wokoma et al. 2009; Makusidi et al. 2014)

The cause of kidney disease in most of the patients in this study was not documented, and this may be due to paucity of nephrologist, lack of good investigative apparatus, late presentation and poor follow up. However about 40% of patients had chronic kidney disease and most of them were anaemic; and this is the pattern as reported previously (Makusidi et al 2014; Wokoma et al. 2009).

Since the commencement of renal replacement therapy in Nigeria more than 3 decades ago, there has been consistent advancement in managing patients with kidney disease. This has been from state of hopelessness with only one flagging haemodialysis center to the present day multiplicity of haemodialysis centers in almost all the cities in all states of the federation. Also there are centers offering peritoneal dialysis and kidney transplant. This development has been froth with various socioeconomic and political challenges that has limited the desired impact on outcome of patients with kidney diseases in Nigeria (Okafor et al. 2012).

Patients had the highest number of haemodialysis sessions in January though new patients were more in the months of June and September. Festive period of Christmas and New Year is usually well celebrated in this part of the country with homecoming of families. There is more likelihood of support of the patients by families, friends, and associates. This support is not sustained through the other months of the year.

Most of the patients (84.3%) could not sustain haemodialysis for more than a month, only 4.6% were able to sustain haemodialysis for about 6 months. About 73% of patients had a total of less than 6 sessions of haemodialysis and less than 10% of the patients had more than 12 sessions of haemodialysis. This poor outlook of haemodialysis as noted above is consistent with earlier reports(Makusidi et al. 2014; Wokoma et al. 2009; Alebiosu et al. 2001; Arije et al. 2000) which is contrary to report from developed countries(Robinson et al. 2009, Goodkin et al. 2003). Poverty, lack of infrastructures leading to high cost of haemodialysis, non inclusion of renal care in flagging health insurance, unfavourable government policies, no support to patients by either government or non government organizations are the contributing factors for non sustenance of haemodialysis in this study. Thus low patronage of the haemodialysis centers, only 108 patients had haemodialysis in a year and less than 70 haemodialysis session in a month. The also has challenges with other support services like electricity and water supply. These factors will not encourage the industries and other profit oriented investors to invest in kidney care

especially haemodialysis

There are various modalities of haemodialysis depending on the type, stage and severity of kidney disease. Patients with acute kidney disease and acute on chronic kidney disease usually requires salvage (intermittent or continuous) haemodialysis which terminates on improvement of kidney function. However patients with end stage kidney disease requires maintenance haemodialysis (thrice weekly) until patient is transplanted. In this study only a patient was able to sustain twice weekly maintenance haemodialysis.

Haemodialysis is froth with complications including hypotension, hypertension, bleeding, deep vein thrombosis and disequilibrium syndrome(Makusidi et al. 2014, Wokoma et al. 2009, Alebiosu et al. 2001, Ahmad et al. 2014) as reported in this study. These complications can be averted by proper assessment and monitoring of the patients before, during and immediate post haemodialysis.

Management of kidney disease is expensive globally, accounting for significant proportion of the health budget in most developed countries (USRDS, Honeycutt et al. 2013). These countries have designed various method of reducing this cost for the patients with kidney diseases. In most developing countries like Nigeria, patients don't have such subsidy and no policy to reduce the cost of kidney care. This has contributed to non sustainability of haemodialysis as shown in this study. There is need for intervention by the various health related organs/agencies of the government including the health insurance to ameliorate the cost of haemodialysis. Furthermore well articulated health policies focusing on prevention of kidney diseases will reduce the burden of the diseases and the number of patients requiring haemodialysis.

CONCLUSION AND RECOMMENDATION

The first year of haemodialysis at Enugu state university teaching hospital was remarkable as many patients hitherto not able to assess haemodialysis were dialyzed. Sustenance of haemodialysis was the main challenge encountered which is attributable to poor economic state prevalent in the country and in the patients.

There is need for patient oriented policies and programs that will subsidize the cost of haemodialysis and/or prevent the emergence and deterioration of kidney diseases in the populace.

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REFERENCES

Afolabi MO, Abioye-Kuteyi EA, Arogundade FA, Bello IS. (2009). Prevalence of chronic kidney disease in a Nigerian family practice population, South African Family Practice; 51(2):132-137.

Ahmad A1, Qureshi MA, Rahim A. (2012). Complications during Haemodialysis. Pjmhs;1:448 -450.

Alebiosu CO. (2001). Detrimental effects of late referral for dialysis. Afr J Health Sci.8:89–92

Arije A, Kadiri S, Akinkugbe OO. (2000). The viability of hemodialysis as a treatment option for renal failure in a developing economy. Afr J Med MedSci.;29:311–4

Daugirdas J. T., Black P.G., Ing T.S. (2007). In "Handbook of Dialysis". 4th ed. Philadelphia, PA: Lippincott Williams & Wilkins, a Wolters Kluwer Business..

Ezeala-Adikaibe NP, Mbadiwe N, Chime P, *et al*. (2014). Pattern of medical admissions at Enugu State University of Science and Technology Teaching Hospital: A 5 year review. Ann Med Health Sci Res;4:426-31.

Goodkin DA, Bragg-Gresham JL, Koenig KG, Wolfe RA, Akiba T, Andreucci VE, Saito A, Rayner HC, Kurokawa K, Port FK, Held PJ, Young EW.(2003). Association of comorbid conditions and mortality in hemodialysis patients in Europe, Japan, and the United States in the Dialysis Outcomes and Practice Patterns Study (DOPPS). J Am Soc Nephrol 14: 3270–3277.

Honeycutt AA, Segel JE, Zhuo X, Hoerger TJ, Imai K, Williams D. (2013). Medical costs of CKD in the Medicare Population. JASN; 24 (9):1478-1483

Makusidi MA, Liman MH, Yakubu A, Isah MD, Abdullahi S, Chijioke A. (2014). Hemodialysis

performance and outcomes among end stage renal disease patients from Sokoto, North-Western Nigeria. Indian J Nephrol;24(2): 82–85.

Okafor UH, Ekwem I, Wokoma FS. (2012). Challenges of kidney care in a resource poor nation: a study of private kidney care centre in Nigeria. NMJ;53:47-50.

Pozo M.E, Leow JJ, Groen RS, Kamara TB, Hardy MA , Kushner AL. (2012). An overview of renal replacement therapy and health care personnel deficiencies in sub-Saharan Africa. Transpl Int. 25;(6):652 – 657.

Robinson BM, Port FK. (2009). International Hemodialysis Patient Outcomes Comparisons Revisited: The Role of Practice Patterns and Other Factors. CJASN. 4;(1): S12-S17

Ulasi II and Ijoma CK. (2010) The Enormity of Chronic Kidney Disease in Nigeria: The Situation in a Teaching Hospital in South-East Nigeria. J Trop Med;: 501957. http://dx.doi.org/10.1155/2010/501957(Date accessed: 3/9/17)

U.S. Renal Data System (2010). USRDS 2010 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States, Bethesda, MD, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases, http//www.USRDS.org (Date accessed: 4/9/17)

Wokoma FS, Okafor UH. (2009). The clinical and epidemiologic characteristics of patients treated at the haemodialysis unit of the university of Port Harcourt teaching hospital during the first year (January to December 2007) of operation. TJN; 1: 5 – 7