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Lagos Renal Registry: An Audit of Renal Replacement Therapy in Five Public Dialysis Units in Lagos Metropolis

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ABSTRACT

Introduction: Renal registries are databases containing specific disease and treatment related information about patients with renal diseases. In Nigeria, early attempts at establishing a national renal registry encountered considerable challenges as participation by centres was low and data entry by the participating centres were inconsistent and grossly inadequate. This report presents the findings of a registry data of dialysed patients between 1st and 7th of December 2011 in 5 public hospitals in Lagos metropolis.

Method: Lagos Renal Registry was established on the 1st of December 2011. The Registry aims to collect and document information on patients with renal diseases in Lagos State quarterly. Collected data would be used to identify challenges in nephrology practices in the State, and measures aimed at resolving the identified problems would be implemented. An audit of dialysis care in 5 public hospitals in Lagos during the first week of December 2011 was conducted.

Results: Fifty five patients were dialysed during the audit period. There were 39 (70.9%) males and 16 (29.1%) females with a M:F ratio of 2.4:1. Majority of the patients 48 (87.3%) were “crashlanders”

dialysed acutely or within three months of contact with the unit. Hypertension was the commonest aetiology of ESRD accounting for 26 (47.3%) of the dialysed patients.

For financial reasons, dialysis was infrequent with 24 (43.6%) patients dialysing weekly and 17(30.9%) on twice weekly dialysis. Consequently, excessive inter-dialysis weight gain was common, occurring in 38 (69.1%) of the patients. Blood pressure control was also found to be poor in 37(67.22%) of the patients.

Vascular access was via femoral vein cannulation in 45(81.8%), A-V fistula 6(10.9%) and internal jugular cannulation in 4(7.3%).

Conclusion: In conclusion, the pilot study has demonstrated the feasibility of collaborative data collection by dialysis units in Lagos State with generation of useful information on patients’ characteristics and treatment outcomes.

In developing a renal registry in Nigeria, we propose that State and hospital based Registries be first established. These could gradually be coordinated into a viable National renal registry when experience in large scale data handling and the financial means to coordinate multiple centre information become available

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BACKGROUND

Disease registries are databases containing information about individuals diagnosed with specific disease entities in a defined geographic location. Registries collect information that are useful in documenting, organizing and management of patients in the reference population [1, 2].

Renal registries contain records of people diagnosed with renal diseases who reside within a defined geographic location [3,4,5,6]. They provide the renal care personnel, patients and administrators a variety of information such as, epidemiology of renal disease in the geographical location, trends in aetiology of renal disease over a period of time, comparative data for national and international comparisons, identification of specific needs of the patients and research needs [7,8].

In Nigeria, early attempts at establishing a national renal registry (Ijoma NANCONF 2009 presentation, personal communication) encountered considerable challenges as participation by centres was very low and data entry by the participating centres was inconsistent and grossly inadequate.

During a collaborative renal workshop between Lagos State University Teaching Hospital (LASUTH) Ikeja, Nigeria and LISTER Hospital, Stevenage, U.K, held between 28th November – 2nd December 2011, in which participants from many nephrology units in Lagos were in attendance, a proposal for the establishment of a Lagos Renal Registry (LRR) was made. The Registry aims to collect and document information on patients with renal diseases in Lagos State quarterly. It will however start with an initial pilot study aimed at an audit of some aspects of dialysis services offered during the first week of December 2011, in all 5 renal units operating in public hospitals in Lagos.

The aim of the pilot study is to evaluate clinical characteristics of dialysed patients, their mode of vascular access, treatment parameters, and anaemia management at the 5 selected renal units. It would also provide an avenue to evaluate the feasibility of collaborative research in these units.

This report presents the findings of the audit data on dialysis patients dialysed between 1st and 7th of December 2011 in public hospitals in Lagos metropolis.

METHODS

All five public hospital based renal units in Lagos were selected for this pilot project on establishment of a

viable and sustainable Lagos Renal Registry. Protocol development was undertaken at a participating centres' meeting on the 1st of December 2011. Identification of data items for inclusion, definition of terms, mode of data entry, nomination of unit coordinators and a project coordinator were discussed and agreed on by the participating units.

Data was to be collected on all patients dialysed at the five centres between 1st and 7th of December 2011. Subsequently, data would be collected quarterly for analysis, with the inclusion of other dialysis units operating within the city of Lagos.

An Excel spreadsheet data entry form was subsequently developed and sent to all participating units with instructions on filling and returning of the completed forms to the project coordinator before the 10th of December 2011.

Hypertension was defined as systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg or and/or concomitant use of antihypertensive medications according to the WHO/ISH guidelines [9].

“Crashlanders” were defined as patients dialysed acutely or within three months of their first contact with the nephrology unit.

Statistical analysis

All data were exported into SPSS version 17 statistics software for analysis. Results are presented as numbers and percentages or mean \pm SD. Chi-square statistics was used to compare categorical variables. A p -value < 0.05 is considered as being statistically significant.

RESULTS

Fifty five patients were dialysed in the five public hospitals' renal units during the audit period. There were 39(70.9%) males and 16(29.1%) females with a M: F ratio of 2.4:1. Male preponderance was observed in all age groups and at all the five centres. [Table 1] The mean age of the dialysed patient was 45.3 ± 17.5 yrs.

Fifty two patients (94.5%) were “crashlanders”, dialysed acutely or within three months of contact with the unit, while 3(5.5%) had dialysis after more than three months of initial contact and follow-up at any of the units.

Fig. 1: Political map of Lagos State



Location of the Hospitals:

1. Lagos State University Teaching HospitalIkeja Local Government
2. Lagos University Teaching HospitalMushin Local Government
3. General Hospital AlimoshoAlimosho Local Government
4. General Hospital GbagadaKosofe Local Government
5. Lagos Island General HospitalLagos Island Local Government

Hypertension was the commonest cause of ESRD accounting for 26 (47.3%) of the dialysed patients. In addition, in 5 (9.1%) of the patients, long term hypertension coexisted with Diabetes mellitus

and the units were uncertain as to the primary aetiology of ESRD. Chronic glomerulonephritis was the second commonest occurring in 10(18.2%) of the dialysed patients. Other aetiologies are Obstructive uropathy

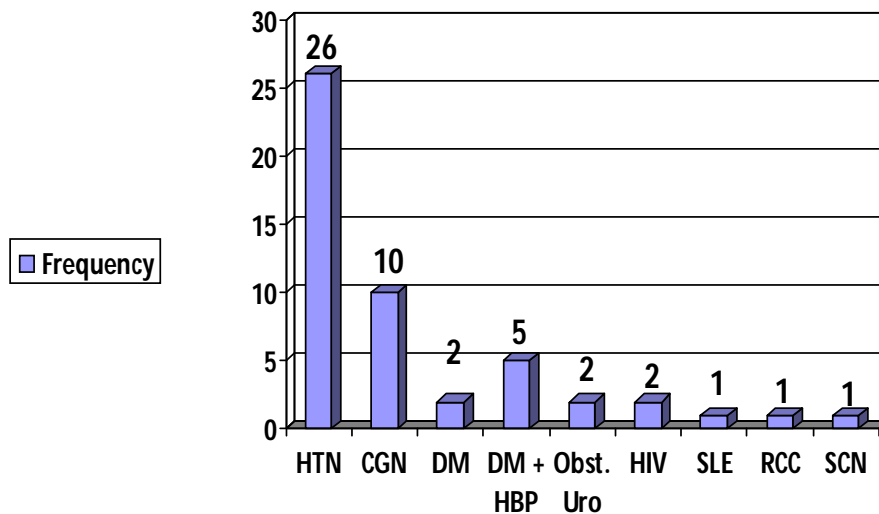


Fig. 1: Aetiology of CKD (all centres)

Table 1: Centre Specific Audit Data

	LASUTH	LUTH	ALIMOSHO	GH LAGOS	GBAGADA	All Centres
N	10	25	7	6	7	Total: 55
M:F Ratio	6:4	17:8	5:2	5:1	6:1	39:16
Commonest aetiology	HTN: 20% CGN: 20%	HTN: 64%	HTN: 71.4%	HTN: 50%	CGN: 71.4%	HTN: 47.3%
Percentage "crashlanders"	90%	92%	100%	100%	100%	94.5%
Modal frequency of dialysis	3ce weekly: 70% of patients	Once weekly: 52% of patients	2ce weekly: 57.1% of patients	Bimodal: - 2ce weekly:	Once weekly: 71.4%	2ce weekly: 30.9%
Modal Duration of dialysis	Bimodal: - 4Hrs: 50%, 3Hrs: 50%	5Hrs: -75%	4Hrs: 100%	4Hrs: 83.3%,	3Hrs: 71.4%,	4Hrs: 40%
A-V fistula rate	10%	16%	14.3%	0%	0%	10.9%
Internal Jugular cannulation	10%	12%	0%	0%	14.3%	7.3%
BP control rate	40%	16%	14.3%	50%	28.6%	27.3%
At or > target Haematocrit rate	10%	8%	14.3%	0%	0%	7.2%
Iron administration rate	80%	32%	71.4%	50%	57.1%	50.9%
EPO administration rate	80%	32%	71.4%	16.7%	42.9%	45.5
Blood transfusion rate	90%	52%	28.6%	33.3%	71.4%	56.4%
Dialyzer reprocessing	No	No	No	No	Yes	-
Average cost of Dialysis	N30,000.00	N20,000.00	N15,000.00	N15,000.00	N12,000.00	N18,400.00

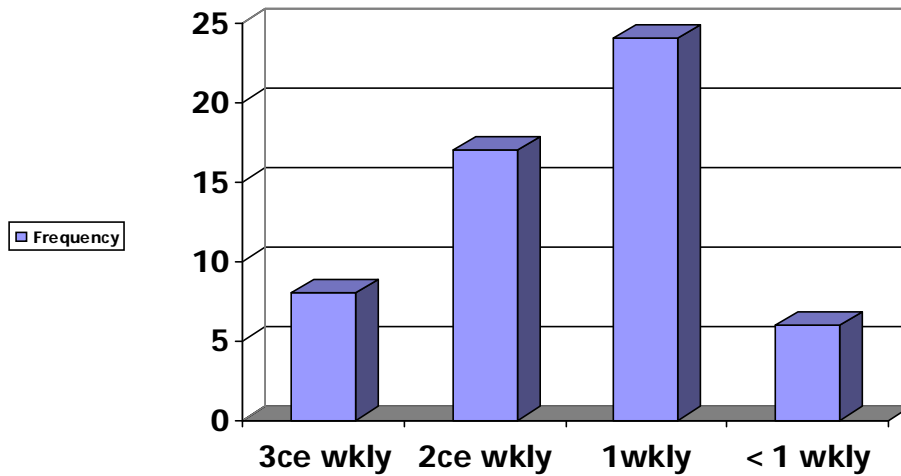
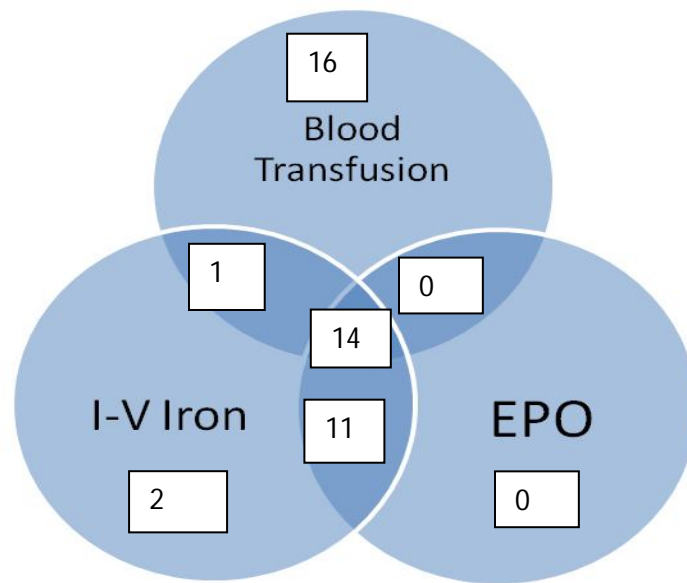


Fig. 3: Frequency and duration of dialysis

in 3(5.5%) patients, 2 (3.6%) had Diabetes Mellitus, 2(3.6%) had Lupus nephritis, 2(3.6%) had HIVAN, Sickle cell nephropathy 1(1.8%), Renal Cell Carcinoma 1(1.8%), Multiple myeloma 1(1.8%) and chronic pyelonephritis 1(1.8%). The aetiology was not documented in 1(1.8%) patient. [Figure 2]

Forty five point five percent of patients diagnosed with hypertensive nephrosclerosis were below 40yrs of age. Seropositivity rate for HIV and HBsAg among the dialysed patients was 3.6% each, while 1(1.8%) was HCV positive.



Total number of patients transfused	31(56.4%)
Total number of patients on erythropoietin (EPO)	25(45.5%)
Total number of patients on Intravenous Iron	28(50.9%)
Total number of patients not on treatment	11(20%)

Fig. 4: Anaemia management modalities at all the centres

Eight patients (14.5%) were on thrice weekly dialysis, while 17(30.9%) were on twice weekly dialysis. 24(43.6%) patients dialysed weekly. The remaining 6(10.9%) dialysed infrequently, less than once in two weeks. 22(40%) of the patients had 4hours/ session dialysis, while 15(27.3%) patients had 5hours/session, another 15(27.3%) patients had 3 hours/session. 6hour session was performed in 1 patient (1.8%) and 1 patient had a 3.5 hour session. [Figure 3]

Forty five patients (81.8%) had dialysis via femoral vein cannulation, 6(10.9%) with A-V fistula while 4(7.3%) patients had internal jugular catheters out of which one was a tunnelled catheter. 5 (9.1%) of the 48 crashlanders had A-V fistulas compared with 1(1.8%) of the 7 non crashlanders. [Table 1]

Forty six (83.6%) patients had BP documented out of which 9(16.4%) had BP < 140/90mmHg with 37(67.2%) having BP above that level. Mean systolic blood pressure was 159.5±35.5mmHg; mean diastolic blood pressure was 92.2±15.6mmHg. [Table 1]

Inter-dialysis weight changes were assessable in 31(56.4%) patients. It varied between -2 to 8Kg with a mean of 1.72±2.07Kg. 4(7.2%) patients lost weight during the inter-dialysis period while 16(29.1%) gained 2Kg or less. 11(20.0%) patients gained more than 2Kg during the inter-dialysis period. Interdialysis weight changes was not assessable in 24(43.6%) of the patients. Mean PCV was 24.16%±11.6 % (2SD). 2(3.6%) patients had haematocrit levels within K/DOQI recommended haematocrit level of between 33 to 36%. In 3(5.4%) patients, the haematocrit levels were above K/DOQI recommended target. In the remaining 50(90.9%) patients, haematocrit levels were below the recommended target. [Table 1]

Thirty one (56.4%) patients had blood transfusion, 28(50.9%) received intravenous iron therapy and 25(45.5%) patients had erythropoietin. 11(20.0%) anaemic patients did not receive treatment for anaemia correction despite falling short of the recommended haematocrit target. [Figure 4]

Average cost of dialysis was N18,400.00K ± N7,092.25K.. per session. Cost of dialysis varies considerably between centres and in one of the centres, indigent patients were dialysed free.

DISCUSSION

Renal registries collate, document and disseminate information that are useful in the management of

patients with renal diseases in any reference population. By identifying characteristic patterns of renal disease presentation, treatment practices and outcomes in the population, renal registries have contributed significantly to the improvement of renal care in countries with established registries.^[3,4,5] The Nigerian health care system could improve on outcomes if it followed the lead of these countries with established disease registry, by systematically utilizing the depth of information provided by such registries in planning, executing and monitoring of health care in the country.

The pilot Lagos Renal Registry was planned by participating units to have a simple design that would encourage adequate data collection by participating units within a short period of time with the analysis and dissemination of the findings within a month of data collection. The design also took into consideration the resources available to achieve the planned objectives. Thus, five public hospital based renal units in Lagos (Population 17 million) were selected for the pilot project as they cover a wide geographical location in 5 of 20 Local Government Areas of Lagos [Figure 1] and are estimated to provide Renal Replacement Therapy (RRT) for between 30 to 40% of patients on dialysis in Lagos State.

Fifty five patients were dialysed in all the five units during the audit period, a male preponderance was observed in all the units. [Figure 1] The observation of more male patients undergoing dialysis is in agreement with previous reports on ESRD population in Nigeria [10,11,12]. Majority 52 (94.5%) of the 55 patients were dialysed acutely or within three months of contact with the unit because of late referral. There is good evidence that crash landing into dialysis is associated with a number of poor outcomes. These include higher risk of hospital admissions; more intensive medical input to establish RRT and a higher mortality rate [13, 16, 17]. Late referral is also considered a quality marker for pre-dialysis care and has poorer outcomes [13]. There are several possible causes for this common feature of late presentation. Blood pressure and urinalysis screening programmes have revealed high burdens of hypertension and proteinuria in Nigeria [14,15], yet there is a lack of universal access to primary care. Low incomes preclude access to medication and medical intervention, and many patients present at late stages of uraemia, only when symptomatic.

An interesting observation is the fact that 4 of 5 patients with A-V fistula were crashlanders. This could be explained by the recent policy of one of the participating centres in which ESRD patients are scheduled for fistula creation as soon as diagnosis is established. The centre has the highest rate of fistula creation and their approach is worth exploiting by other units where surgical competences exist, more especially as the cost of creating an A-V fistula is less than that of inserting an internal jugular catheter at the public centres. Majority of the patients (81.8%) however had dialysis via femoral vein cannulation, an indication of inadequate vascular access management in all the centres.

Hypertension was the commonest cause of ESRD 47.3% followed by chronic glomerulonephritis in 18.2% of the patients. This may reflect the limited extent of diagnostic evaluation of patients at the centres and the general lack of long term medical records of patients in most instances. End Stage Renal Disease is a long term complication of hypertension[18,19,20]. The mean age of 45.3±17.5yrs with 45.5% of the patients falling below 40yrs presupposes that majority of the patients developed hypertension in their second or third decade of life. A more plausible explanation is that majority of the hypertensive patients had secondary hypertension from their CKD. The need for accuracy in aetiological diagnosis is one essential area which the registry would have to address in the future.

Dialysis was infrequent in most patients with 43.6% of patients dialysing weekly. This may in part explain the high prevalence of uncontrolled hypertension, with 80.4% having poor blood pressure control and the excessive weight gain seen in 11 of the 31 patients with available weight records. Infrequent dialysis, excessive inter-dialysis weight gain and poor blood pressure control have all been shown to contribute significantly to the high mortality rate in the dialysis population [21, 22, 23]

Haematocrit levels within K/DOQI recommended target of between 33 to 36% [24] was observed in 3.6% of the patients. 5.4% of the patients had haematocrit levels above K/DOQI recommended target. In the remaining 50(90.9%) patients, haematocrit levels were below the recommended target. Blood transfusion rate was 56.4%, intravenous iron administration was given to 50.9% of the patients and erythropoietin usage rate was 45.5%. 11(20.0%) anaemic patients did not receive treatment for

anaemia correction. These figures clearly demonstrate the inadequacy of anaemia treatment in these centres. Focusing on the problems of anaemia management with the intention of resolving determinants of poor outcomes is definitely desirable in this group of ESRD patients.

Average cost of dialysis was N18,400.00K ± N7,092.25K. per session. Cost of dialysis varies considerably between centres. Payment for dialysis is out of pocket as the National Health Insurance Scheme (NHIS) does not cover dialysis treatment. With a national minimum wage of N18,000.00 per month,^[25] most patients are unable to afford dialysis therapy. This, to a large extent, explains many of the inadequacies in treatment and the consequent poor outcomes of such deficiencies. Financing dialysis therapy is beyond the operational competencies of the renal units. However, data derived from renal registries would definitely provide necessary vital information that is useful in the advocacy for improved funding of dialysis therapy by the Government of the country.

CONCLUSION

In conclusion, this pilot study has demonstrated the feasibility of establishment of a viable renal registry in Lagos. In addition, data obtained from the study highlighted important inadequacies in blood pressure control, anaemia management and fluid balance of the dialysed patients. These poor outcomes are largely due to infrequent dialysis therapy as a result of poor financial capability of the patients.

Establishing a renal registry would definitely provide a powerful information resource that could be utilized in the advocacy for improved funding of dialysis therapy by the Government of the country.

In developing a renal registry in Nigeria, we propose that State and hospital based Registries be first established. These could gradually be coordinated into a viable National renal registry when experience in large scale data handling and the financial means to coordinate multiple centre information become available.

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