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Original Research Article

Prevalence of renal failure patients with three-weekly standardized dialysis session at university teaching hospital of Butare

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ABSTRACT

Background: Dialysis is a treatment of choice to alleviate severe complications of end-stage renal disease. Renal failure is the most prevalent worldwide among diabetic, hypertensive, and where infective diseases are frequent. The study aimed to assess the prevalence of patients having three standard dialysis sessions weekly at University Teaching hospital of Butare dialysis centre from June 2013 to June 2014.
Methods: A descriptive cross-sectional study used routine hospital data from university teaching hospital of Butare dialysis unit and its size were 110 patients who fulfilled the study inclusion criteria. Secondary data were collected using a checklist with different variables like age, sex, profession, health insurances, acute renal failure, chronic renal failure, diabetes mellitus, hypertension, glomerular disease sepsis, severe dehydration, frequency of dialysis per week and outcomes like renal recovery, death, stopping treatment and being referred. Data were analysed using SPSS software.
Results: The findings showed that 40.9% of patients received three or above dialysis sessions per week and 59.1% of patients received less than three sessions per week.
Conclusions: The study concluded on inadequacy dialysis treatment and recommended further studies to explore more about this inadequacy.

Keywords: Dialysis, Renal failure, University Teaching Hospital of Butare

INTRODUCTION

Dialysis is treatment technique applied to patients with chronic kidney diseases commonly known as chronic renal disease. It consists in artificially filtering waste products from blood following the inability of kidney to do so. It could be performed at hospital or at home and the decision is made by the medical doctor. Acute renal failure develops rapidly, and kidneys lose their filtering ability, dangerous levels of wastes may accumulate, and your blood's chemical makeup may get out of balance.[1]

The symptoms of worsening kidney function are non-specific, and it is diagnosed in many cases insidiously, through opportunistic screening among patients at risk, such as those with high blood pressure or diabetes, cardiovascular disease, anaemia or pericarditis.[2] Treatment with peritoneal dialysis preserves native kidney function longer. This advantage has led several experts to recommend that peritoneal dialysis is the best modality to use early in the course of renal failure. There are some relative contraindications to peritoneal dialysis. Another advantage is that, it could be also

carried out at home by the patient.[3] Recent professional guidelines classify the severity of chronic kidney disease (CKD) in five stages, with stage 1 being the mildest and usually causing few symptoms and stage 5 being a severe illness with poor life expectancy if untreated. Stage 5 CKD is often called end-stage renal disease (ESRD), end-stage renal failure (ESRF), or end-stage kidney disease (ESKD) and is synonymous with the now outdated terms chronic kidney failure (CKF) or chronic renal failure (CRF) and no specific treatment unequivocally shown to slow the worsening of chronic kidney disease.[2,4] The gold standards treatment mainly focus on controlling risk factors, such as blood pressure control and accurate treatment of original disease, to slow down the progression of CKD to stage 5.[4]

A systemic review set out to determine the prevalence rate of CKD among 13 Sub-Saharan countries estimated an overall CKD prevalence of 13.9% for the region. The regional countries were Kenya 4%, Democratic Republic of Congo 19.8% and Rwanda 10%.[5] The awareness about renal diseases and management of patients with chronic renal failure in Rwanda have been taken as a cornerstone in the cost-effective management of that disease, using a well-structured health system in place.[6]

The frequency of dialysis was established at three times a week in 1965 and this frequency is used in most centres around the world. the KDOQI recommended three times per week dialysis sessions which were associated with the good outcome because dialysis sessions less than three times per week and duration less than 8 hours per week has been reported to be associated with an increased risk of mortality, and the Kt/V was significantly higher in those who received three dialysis sessions per week than those on two dialysis sessions per week in other studies.[7,8] In most developed Western and Asian countries, patients on chronic haemodialysis are undergoing three dialysis sessions weekly. In developing countries and some developed countries, a twice-weekly schedule independent of residual kidney function is still accepted, sometimes because of lack of resources and some other times because of patients' resistance to undergo three sessions per week. Rwanda has only two dialysis centres, many people require dialysis and few of them accessed on, 11% of patients diagnosed with renal failure was able to undergo dialysis in 2013.[9]

Dialysis is a procedure that is a substitute for many of the normal duties of the kidneys, and it is said to be expensive, a procedure, which is performed once a month, costs between Rwf 900,000 to 1.2 million, depending on which procedure one uses. It is estimated that the prevalence of end-stage kidney disease in Sub-Saharan Africa is 100 cases per million people. Now health officials say that since the government cannot, through its budget support all these people to get the treatment, it is crucial to put in place preventive measures to curtail the number of new cases. Due to its chronicity patterns, diseases like diabetes, hypertension, hepatitis B and C are among the causes of CKD. He called upon the population to do regular check-ups for early diagnosis and treatment.[10] The prevalence of thrice weekly dialysis sessions among end stage renal failure is unknown for east African countries neighbouring Rwanda.[11] Budgetary constraints and the lack of trained personnel necessitate strict rationing of RRT and encourage user-pays systems.[12] Given the vast gulf between per capita spending on health care and costs of haemodialysis in low and middle-income countries (LMIC), it is not surprising that maintenance haemodialysis is rarely a government priority and often confined to the private sector.

This study aims to determine the prevalence of renal failure patient who received three standard dialysis treatment sessions per week at university teaching hospital of Butare during the study period.

METHODS

It was a descriptive cross-sectional research design using quantitative methods to assess the proportion of thrice-weekly dialysis sessions among patients with renal failure treated at BUTH during the period of study. Dialysis Unit located in Huye District, Southern province of Rwanda by collecting pertinent data in patients' records using a data collection checklist from June 2013 to June 2014. This design enabled the researcher to describe the population of study and calculate the proportion of thrice-weekly dialysis treatment sessions.

Ethical and hospital administrative procedures were taken into account before having access to the patient records. This study was ethically cleared by Mount Kenya University and approving committee of the School of Health Sciences. It got permission letters respectively from to the administrative authorities of hospitals and ethical approval from the college of medicine and health sciences of the University of Rwanda. The privacy and confidentiality of the patient information cared as researchers used patients' codes rather than their names. The results of the study will only be used in improving and protecting the health of the population.

The sample size calculation for this study was done using Yamane 1967 formula, Where $n=N/1+N(e)^2$, e=0.05, Hence, $n=151/1+151(0.05)^2$, n=110. The study used simple random sampling technique to select 110 participants among 151 participants fulfilled inclusion criteria.

The study included all patient files consulted during the study period and had all required information and excluded all patient files consulted in the study periods but missing one of the study variables and or files not available at the time of data collection.

After coding, rating, ranking, and categorizing the collected data, the researcher did data entry and data

analysis using Statistical Package for Social Scientists version (SPSS) software.

RESULTS

The findings of this study showed that male dominated female with 50.9% and 31.6%, respectively. The high rate of study participants was dominated by age structure between 36-55 years old with 39.1% and followed by 37.3% of those with age group between 16-35 years old. Cultivators dominated other profession with 33.6% and followed by private-sector workers with 31%. The community-based health insurance (CBHI) users dominated with 50.9%, followed by other insurances with 28.2% and finally with 20.9% of private patients (Table 1).

Table 1: Socio-demographic characteristic of respondents.

Variable		Frequency	Percentage
Gender	Male	56	50.9
	Female	54	49.1
Age group in years	Below 15	15	13.6
	16-35	41	37.3
	36-55	43	39.1
	Above 55	11	10.1
Profession	Student	25	22.7
	Cultivator	37	33.6
	Private sector	34	31
	Public sector	14	12.7
Health insurances	CHIS	56	50.9
	RSSB	18	16.4
	Private	23	20.9
	FARG	13	11.8

Source: Secondary data

The main finding of this study in respect to the proportion rate of patients accessing to adequacy dialysis treatment at University Teaching Hospital of Butare was 40.9% who received three or above of dialysis sessions per week and 59.1% of patients received two or less dialysis treatment sessions per week (Figure 1).

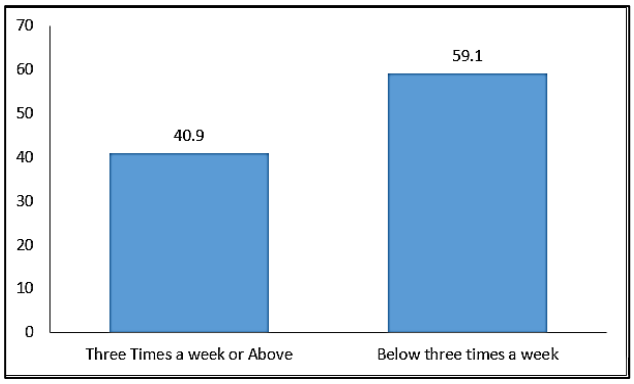

Figure 1: Proportion of patients who received three sessions of dialysis per week.

DISCUSSION

The proportion of patients who received the three sessions or above of dialysis per week equal to 40.9% and other remaining 59.1% had received less than three times a weekly standard dialysis session.

This study finding showed that 40.9% received three and more session of dialysis while in another, study was 28% of adequate haemodialysis sessions as per KDOQI guidelines. The adequacy of number sessions were hampered by pressure caused by a big number of patients.[13]

Although three weekly conventional dialysis sessions are advised. Studies showed that not all patients are compliant to them.[14]

Studies from different countries have shown that highly frequent scheduled dialysis sessions more than three helped to prevent neuropathy in three of the first four patients who were sent home and hypertension was difficult to control in some patients.[15] This was found to increase stamina and well-being, minimize neuropathy, improve control of hypertension, and allow liberalization of diet. It soon became obvious that dialysis 8 to 10 hours three times weekly seemed to control all the major life-threatening complications. As a result, this became the usual dialysis schedule and we stopped our crude efforts to adjust the treatment schedule based on patient symptoms. Three times weekly home haemodialysis had another important advantage in addition to providing what appeared to be adequate dialysis.[16]

Adequate dialysis is the cornerstone for the well-being of each patient. Achievement of the global goals is of paramount importance to improve quality of life, decrease healthcare costs and decrease morbidity and mortality rates in haemodialysis patients.[17]

The mean Kt/V and URR for the study patients were 1.06±0.05 and 54.4±19.3, respectively. Only 39.1% of all patients achieved the Kt/V goal and only 34.4% had target URR. The study revealed similar findings to those carried out in other countries such as Iran, where the mean single-pool Kt/V and URR in the studied population were 1.17±0.4 and 61±11.8%, respectively. The single-pool Kt/V was less than 1.2 in 56.7% of the patients. In addition, URR was less than 65% in 65.2% of the patients. In a study from Sri Lanka, it was shown that only 39 (28.2%) out of 138 dialysis sessions in 31 patients had a Kt/V value ≥1.2 (Rodrigo 2010). However, results from the United Kingdom and other countries of Europe were much better. The proportion of patients in the UK who met the UK clinical practice guideline for URR (>65%) increased from 56% in 1998 to 86% in 2010.[18]

Chronic kidney disease is at least 3-4 times more frequent in Africa than in developed countries. The median

prevalence of kidney replacement therapy globally is 759 per million population (PMP), varying from 4 PMP in Rwanda to 3392 PMP in Taiwan.[19] Hypertension affects approximately 25% of the adult population and is the cause of chronic kidney failure in 21% of patients on renal replacement therapy in the South African Registry. The prevalence of diabetic nephropathy is estimated to be 14%-16% in South Africa, 23.8% in Zambia, 12.4% in Egypt, 9% in Sudan, and 6.1% in Ethiopia. The current dialysis treatment rate ranges from 70 per million populations (PMP) in South Africa to <20 PMP in most of sub-Saharan Africa.[20]

There are large rural areas of Africa that have no health professionals to serve these populations. There are no nephrologists in many parts of SSA; and their numbers vary from 0.5 per million population (PMP) in Kenya to 0.6 PMP in Nigeria, 0.7 PMP in Sudan and 1.1 PMP in South Africa. Chronic kidney disease affects mainly young adults aged 20-50 years in SSA and is primarily due to hypertension and glomerular diseases. HIV-related glomerular disease often presents late, with patients requiring dialysis. Diabetes mellitus affects 9.4 million people in Africa. The prevalence of diabetic nephropathy is estimated to be 6-16% in SSA. The current dialysis treatment rate is <20 pmp (and nil in many countries of SSA), with in-centre haemodialysis the modality of RRT for the majority. Transplantation is carried out in a few SSA countries: South Africa, Nigeria, Mauritius and Ghana, with most of the transplants being living donor transplants, except in South Africa where the majority are from deceased donors.[20]

Between 2 and 7 million people are estimated to die of end-stage kidney disease (ESKD) globally every year, owing to the lack of access to life-sustaining treatment. There are many systemic and structural barriers to access to dialysis in low-resource settings, including lack of kidney disease awareness, poor access to diagnosis, limited availability of infrastructure and staffing required, and cost.[21]

The studies were done in other different countries shown that the accessibility to dialysis treatment is still hindered by many factors such as big cost, few professionals and lack of equipment**.** The cost of dialysis is still a big challenge hindering patient to access the dialysis treatment in Burundi, states that at CHUK there are not enough materials and laboratory consumables for dialysis.[22] The patient must go abroad to get the placement of a peritoneal catheter and come back for dialysis. It is worth mentioning that dialysis remains very expensive in Burundi compared to Rwanda. Whereby one session varies from 100 to 200 USA dollars without medications and exams, while the patient must change liquid bags three times per week. For peritoneal dialysis, one bag of liquid costs BIF 30,000, while the patient uses four bags per day. The placement catheter cost around BIF 1,000,000 for a period of four years.[22]

Kenya, annual dialysis for chronic kidney disease cost $5,338 in public versus $11,024 in private hospitals while a large proportion of Kenyans aged 15 to 49 years do not have health insurance.[23] To date, no sustainable treatment program exists for kidney failure in countries in sub-Saharan Africa. No data are available on the incidence, prevalence or cause of chronic kidney disease (CKD).[24]

Renal replacement therapy is limited to less than five percent of those that need it especially in the sub-Saharan Africa. The major challenges of kidney diseases in Africa include the high prevalence, delayed presentation, cost of treatment, general lack of preventive measures, lack of epidemiological studies and general lack of functional renal registries.[25]

In 2007, Africa's dialysis population constituted only 4.5% of the world's dialysis population, with a prevalence of 74 per million population (PMP), compared to a global average of 250 PMP.[26] The prevalence of peritoneal dialysis (PD) was 2.2 PMP, compared to a global prevalence of 27 PMP, with the bulk of African PD patients (85%) residing in South Africa.[26] With an average incidence of 182 and prevalence of 522 patients with end-stage kidney disease (ESKD) per million population, North Africa (NA) spends $650 million on dialysis and transplantation despite an estimated annual loss of 600,000 life years.[27]

The study was limited to the available routine hospital data and the sample was small considering to the country population, this due to the fact dialysis services is very expensive, scarce, and highly skilled staff therefore available only at teaching hospital level. The researchers recommend more studies in this field.

CONCLUSION

The dialysis treatment in Rwanda like in other developing countries encounter many challenges due to lack of enough equipment's, specialized technicians, number centres for dialysis and cost. These factors resulted in the inadequacy of dialysis treatment which influences the outcome of treatment. Even those accessed no one knows and reported on the adequacy and outcomes of dialysis treatment in Rwanda.

Recommendations

Dialysis treatment in Rwanda still needs improvement, because only below 40% of patients received standard three sessions of dialysis per week and major challenges include the cost, outdated infrastructures, and qualified technicians. It recommended to the ministry of health and other policymakers to plan programmatic management of non-communicable diseases focusing on bridging current gaps in case management, on health education and promotion for healthy style health insurances are also recommended to allow their clients access dialysis care for better outcomes.

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