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RESEARCH

Retrospective review of renal cases in a tertiary hospital in West Africa

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ABSTRACT

Introduction

Kidney diseases commonly present to the Komfo Anokye Teaching Hospital (KATH). There has not been a comprehensive analysis of the number of renal cases managed. We set out to analyze comprehensively the renal cases seen at KATH to describe the trends for the past decade.

Methods

A retrospective study was conducted from January 2006 to December 2016. We collected secondary data from the records on the wards, outpatient clinics and Haemodialysis unit from the KATH annual reports. We then plotted the trends in kidney diseases seen and managed in KATH and the corresponding mortalities over the decade.

Results

Renal outpatient clinics started in 2007. There were an average of 65,273 medical outpatients seen yearly with kidney diseases accounting for 5,397 (8.3%). Renal clinic patients increased by 271% from 710 in 2007 to 1927 in 2016.

The average yearly medical admission was 6,880 patients of which kidney disease admissions accounted for 276 (4.0%). The average position of renal admissions was 6th (range 2nd-10th) of total medical admissions. The average annual mortality rate of renal admissions was 32.7% as compared to the average general medical cases mortality of 23.8% annually.

Haemodialysis services commenced in 2006. Patients on haemodialysis have increased by 50 times from 8 in 2006 to 407 in 2016. Haemodialysis session also increased by 38.8 times from 59 in 2006 to 2350 in 2016. The average number of patients on Haemodialysis per year was 211.5.

Conclusion

Renal diseases are common and associated with significant morbidity and mortality. A concerted effort is needed to enhance the diagnosis and management of kidney diseases in Ghana.

INTRODUCTION

The prevalence of kidney diseases is increasing worldwide. Kidney diseases are commonly classified as acute kidney disease or chronic kidney diseases. Chronic kidney disease (CKD) is a recognised worldwide heath problem with increasing incidence and prevalence worldwide[1]. The prevalence in Africa is estimated to be 13.9% in a meta-analysis[2] and believed to be increasing. The prevalence of CKD in Ghana is currently unknown but the causes of chronic kidney disease such as hypertension and diabetes are increasing in prevalence.

Prevalence of hypertension ranges from 4.5%- 54.6%[3] with the highest among urban dwellers[4,5]. The prevalence of hypertension is increasing with urbanisation and westernization. Almost half of hypertensive patients in Ghana have CKD[6].

Diabetes mellitus is also increasing in prevalence and noted to be the commonest cause of CKD worldwide. The total number of people with diabetes worldwide is projected to rise from 171 million in 2000 to 366 million in 2030 with an estimated prevalence of 4.4% from 2.8% in 2000[7]. In Ghana, the age adjusted prevalence of diabetes was 6.4% in a community based study in 2002[8] which is higher than the estimated global prevalence for 2030.

The high prevalence of infectious diseases coupled with the increase in non-communicable diseases due to lifestyle changes in developing countries make the disease burden greater than in developed countries [9].

Developing countries including Ghana are saddled with rampant use of herbal medication for the treatment of medical and spiritual conditions. This is because they are readily available without prescription and are believed to be "natural" and therefore safer though the safety profile of such medications are unknown. The use of herbs is associated with acute kidney injury, tubular dysfunctions, hypertension, chronic kidney disease, chronic interstitial nephritis, renal papillary necrosis and even

urothelial carcinomas[10]. This is believed to worsen an already precarious prevalence of kidney disease in developing countries. Kidney diseases have been managed in KATH since the hospital's inception. Management of kidney diseases in KATH is somewhat sub-optimum. The low nephrologist numbers in Ghana[11], inadequate renal replacement services[12] and the absence of renal transplant services makes the management of ESRD a daunting task for physicians and nephrologists in developing countries such as Ghana. The renal services provided in KATH include in-patient and out-patient care and until 2006 the provision of Haemodialysis services in adults and acute peritoneal dialysis for children with acute kidney injury (AKI). Renal transplantation services is currently unavailable in KATH. Korle Bu Teaching hospital, a tertiary institution provided limited renal transplantation services in 2008[12] but not anymore currently.

To our knowledge, annual reviews of kidney diseases have not been done in any institution in Ghana to describe trends in renal cases seen. We therefore set out to report the trends of kidney diseases seen at the Komfo Anokye Teaching hospital over a decade and the mortality rate of kidney disease admissions. This will serve as baseline data for subsequent studies into renal disease for appropriate management in Ghana and the West Africa.

METHODOLOGY

We conducted a retrospective review of the annual reports of KATH from 2006 to 2016. Documentation of the annual outpatient cases for general medicine, hypertension and renal cases seen were done. The inpatient medical and renal out-patient cases were also documented. Renal cases included chronic and acute kidney injury and excludes cases of pyelonephritis, urinary tract infections, renal stones and other infections of the urinary tract. The number of patients on haemodialysis and number of haemodialysis sessions done during the study period were also recorded. The medical and renal mortality rates over the period were also documented.

Study setting

Komfo Anokye Teaching Hospital (KATH) is a 1,300 bed capacity tertiary facility established in 1955 in Kumasi in the Ashanti region. It's been a teaching Hospital since 1975. The hospital provides services to the Ashanti Region, Brong Ahafo, and the three Northern Regions and to some parts of the Western and Central Regions.

The Internal Medicine Directorate is one of the twelve (12) clinical directorates in KATH. Among the specialized clinics run by the internal medicine directorate are: hypertension, asthma, diabetes, human immunodeficiency virus (HIV), chest, psychiatry, dermatology, haematology, neurology, cardiology, and the renal. The directorate also runs a daily physician specialist general out-patient clinic in specialist consulting room one (CR1). The Directorate of medicine operates seven (7) wards with an average of 205 beds. The turnover per bed for the year was 31 with bed occupancy of 86.4%. The average length of stay on the medical ward was 9 days.

The renal clinic operates twice a week and the hypertension clinic operates once a week. The Haemodialysis unit offers chronic and acute dialysis to patients with kidney disease requiring renal replacement therapy. The renal unit is run by physician specialist, principal medical officers, rotating medical officers and until recently trained nephrologists.

The Haemodialysis unit currently has eight functioning machines but is plagued with frequent shortage of dialysate fluids, power outages and water interruptions which affects service delivery.

RESULTS

A total of 713,194 outpatient medical cases were seen over the study period with an average of 64,835.8 per year. Renal outpatient cases were 13,719 over the period with an average of 1,371.9 patients per year. Renal outpatients are 2.1% of outpatient medical cases seen. Renal and hypertension outpatient cases make up 8.0% of all outpatient medical cases seen at the Komfo Anokye teaching Hospital.

There were a total of 69,603 medical admissions over the study period with an average admission of 6,898 patients per year. Total recorded renal admission was 2,206 patients which excluded the years 2006, 2007 and 2009 as there was no available data as shown in table 1. The average renal admission per year was 275.8. Renal admissions were 4.0% of all medical admissions.

Table 1: number of medical, renal and hypertension cases from 2006-2016

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
No of Medical OPD patients	75877	78934	72971	67014	68694	68335	65620	52400	53660	49893	59796
No of Renal OPD patients	-	710	1135	1355	1214	1710	1326	1274	1602	1466	1927
No of Hypertension clinic patients	3827	3779	3128	3417	3120	4789	4908	4088	3806	3412	4880
No of dialysis sessions	59	718	954	477	206	1397	1326	1274	1602	839	2350
No of patients on Haemodialysis	8	125	150	106	73	235	243	538	278	163	407
Total no of medical admissions	6275	7124	7286	7102	7306	7266	7279	6947	6861	6338	6094
No of Renal admissions	-	-	103	-	159	301	317	212	408	275	431

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Renal position on Top 10 mortality on medical ward	-	-	10th	-	10th	2nd	4th	7th	8th	6th	3rd
Renal mortality rate (%)	-	-	-	-	32.1	38.2	32.2	29.7	25.98	46.9	23.7

No, number; OPD, outpatients department

Table 2 showing the total number of patients seen per year and the average per year

Variable	Total number of patients over a decade	Average no of patients seen per year	Percentage of medical cases
Medical OPD clinics	713194	64835.82	-
Renal OPD clinic	13719	1371.9	2.12%
No of dialysis sessions	11143	1018.36	-
No of Patients on Haemodialysis	2318	211.45	4.82
Renal admissions	2206	275.75	4.0
Renal position on Top 10 Mortality	-	6.25	-
Renal mortality rate (%)	-	32.68	-

OPD; Outpatient department: No; Number

The yearly total outpatient medical clinic cases for all specialties showed a decreasing trend over the study period as shown in the Figure 1. Medical outpatient cases decreased from 75877 in 2006 to 59796 in 2016 representing a decrease of 21.2%.

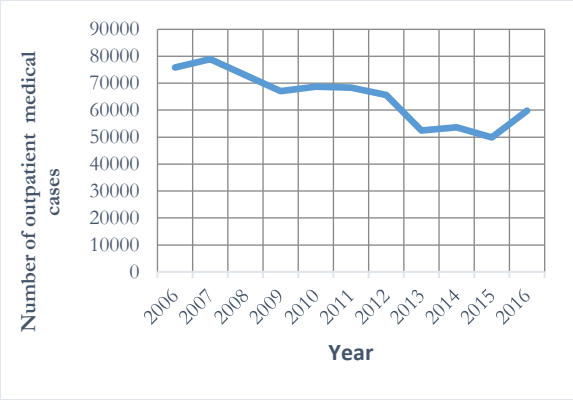

Figure 1 showing the trends in general medical outpatient cases seen in KATH since 2006.

Hypertension clinic in KATH started in 2003. There has been a decreasing trend to a low of 3120 patients in 2010. Patient numbers then increased to a peak of 4908 in 2012 followed by a decrease to 314 in 2015 and then rose to 4880 in 2016 as shown in figure 2. The hypertension clinic has generally increased by 27.5% in 2016 from 2006.

Figure 2 showing the trend in the number of patients seen at the hypertension clinic at KATH

The renal specialist clinic commenced in 2007 and has steadily risen from 710 patients seen in 2007 to 1927 cases in 2016 representing an increase of 171.4% as shown in Figure 3.

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Figure 3 showing the trend in OPD cases seen in the renal outpatient clinic since 2007.

Haemodialysis is the only form of renal replacement therapy currently available for the management of adults with renal cases at KATH. There is no renal transplantation services or continuous ambulatory peritoneal dialysis (CAPD). Haemodialysis patients and sessions have risen steadily since its inception in 2006. The number of ESRD patients on dialysis has increased by 49.9 times from 8 in 2006 to 407 in 2016. The number of Haemodialysis sessions has also increased by 39.8 times from 59 in 2006 to 2350 in 2016 as shown in figure 4 below. This includes sessions done for both acute and chronic kidney diseases requiring renal replacement therapy.

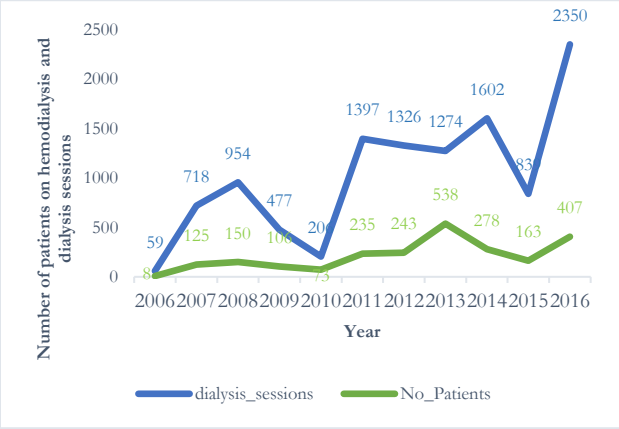

Figure 4 showing the number of patients on Haemodialysis in KATH

Total hospital medical cases admissions increased from 6275 in 2006 to a peak of 7306 in 2010 and is been on a decline since then to 6094 in 2016 as shown in Figure 5 below. Medical admission decreased by 2.9% in 2016 as compared to 2006.

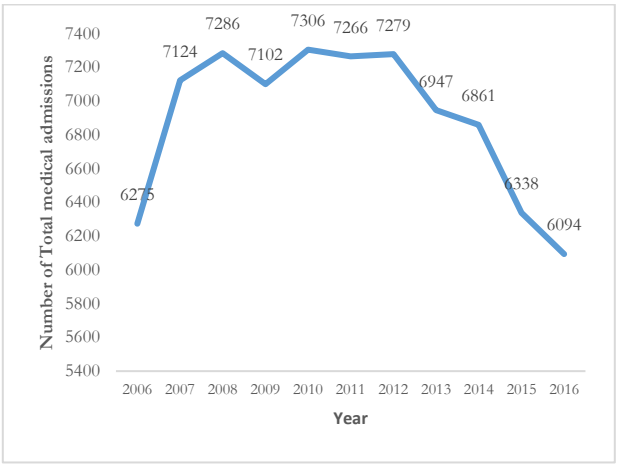

Figure 5 showing the total medical admission over the years since 2006 at KATH

Admission of renal cases increased by 318.4% since 2008 from 103 to 431 in 2016 as shown in the Figure 6 below.

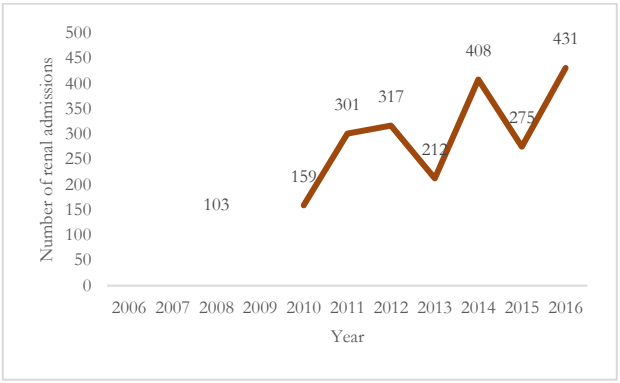

Figure 6 The number of yearly renal admissions on the medical ward

The average annual renal mortality rate ranged from 23.7 to 46.9% of all renal admissions. The highest mortality rate was recorded in 2015 as shown in Figure 7 below.

Figure 7 showing the mortality rate of renal admissions from 2010 to 2016

The position of mortality from renal cases on the top ten causes of death on the medical ward ranged from the second position to the tenth position. In 2011, renal cases was second position in

the top ten causes of mortality on the medical ward from the 10th position the previous year. The mean position of renal deaths was sixth over the study period [Table 1].

DISCUSSION

To our knowledge, this is the first ever review of renal cases seen over a ten year period in KATH and the country as a whole. This review highlights the increasing number of kidney diseases seen in out-patient clinics and those admitted at KATH. It also highlights the significant mortality rates of renal admissions probably due to the unavailability of adequate Haemodialysis machines or the inability of patients to afford renal replacement therapy.

Over the ten-year retrospective review, there has been a decrease in the medical outpatient cases seen. This could be attributable to the capacity of the peripheral hospitals to manage severe medical cases as a result of the training of more specialist in these referral sites. It may also be as a result of increase in peripheral private hospitals with specialist who are able to manage adequately medical cases and therefore refer less to the teaching hospital for specialist management.

There have been a constant increase in the number of hypertension and kidney disease cases seen. This may be due to the increasing prevalence of hypertension and kidney diseases as suggested by some studies[13,14]. The number of hypertensive patients seen might be an underrepresentation of all the cases seen here in KATH as the family medicine directorate also have a chronic care clinic and have also been seeing hypertensive and diabetic patients since 2013 and was not captured in the review. Hypertension has been shown to be a cause of kidney disease and also a sign of kidney disease. In a study by Osafo et al, CKD was found to be present in 46.9% of hypertensive patients[13]. The continual increase in the number of renal cases may also be due to the increasing prevalence of diabetes in Ghana which has been shown to be 6.0% in a community based study[8].

There was a continual decrease in medical admission from 2012. This may be due to the change in the triaging system at the Komfo Anokye teaching hospital after the establishment of the accident and emergency Centre[15]. Some patients are seen and discharged by emergency medicine physicians if found to be stable. Some also die at the emergency unit and may not end up on the medical ward. This may have led to the decrease in medical ward admissions by about 3% over the study period. The decrease in medical admissions could also be due to the training of physician specialist who are now at the peripheral hospitals and able to manage medical cases adequately.

Though there was a decrease in medical admissions, renal admissions have continually increased over the review period by over 300%. This may be as a result of the increasing prevalence of kidney diseases in the Ashanti region and the fact that though there are physician specialists available in the peripheral hospitals to manage these cases, patients with end stage renal disease are referred to the teaching hospitals to access renal replacement therapy. These peripheral hospitals have no renal replacement therapy or nephrologists to manage these ESRD patients. It was shown by Antwi S that there are very few Haemodialysis centres in Ghana, mainly in the teaching hospitals[12]. There have been some improvement in Haemodialysis machines and centres even in private centres in Ghana.

Our review shows an increase in the accessibility of Haemodialysis since its inception in 2006. The number of patients have increased by about 50 folds. There has been a consequential increase in the number of Haemodialysis sessions by about 40 folds. This may be due to the rise in the prevalence of the disease and the fact that more patients with ESRD can now afford renal replacement therapy or are getting support from family and friends for their treatment. The disparity between the increase in patients on dialysis and the number of Haemodialysis sessions is due to the fact that most of the patients on dialysis could not afford the three times a week sessions as suggested by the Haemodialysis (HEMO) study[16]. There are some patients on once a week dialysis session which is very inadequate to improve the quality of life and mortality of patients on Haemodialysis. The mortality of renal replacement therapy in KATH is high. It was shown by Eghan et al,[17] that 90-day mortality on Haemodialysis was 32.4%. Mortality on Haemodialysis was attributed to cardiovascular disease, sepsis and anaemia in a retrospective study conducted in KATH in 2007. Most patients due to increased cost also discontinue treatment and die as shown in a recent systematic review[18].

The mortality rate of renal admissions was higher than the average mortality of all medical admissions. End stage renal disease patients have poor prognosis. This may be due to the inaccessibility to Haemodialysis by most patients seen on the medical ward as most die from uraemic complications, sepsis and cardiovascular diseases. Accessibility to renal replacement therapy has been shown by Antwi S[12] to be very poor due to increased cost and the fact that the national health insurance scheme does not cater for chronic dialysis patients . In the absence of renal replacement therapy, death is inevitable[18]. It has been shown that mortality on Haemodialysis is equally high and therefore there might be the need for governmental support for renal transplantation which has been shown in several studies to be cost effective and associated with improved survival and better quality of life as compared to Haemodialysis and peritoneal dialysis [19-24].

Mortality with or without renal replacement therapy is high in end stage renal disease patients[25]. This may be due to the late presentation of cases for which very little can be done due to the advanced nature of the disease. Late presentation for dialysis has also been associated with poor outcomes due to use of temporary catheters which are associated with access infections. These affect the quality of life in these patients [26,27].

CONCLUSION

There is an increase in the number of kidney diseases seen at KATH. Though there have been a modest increase in the accessibility of renal replacement therapy, there is still an increase

in renal mortality. There is the need to aim for prevention of kidney disease in Ghana and governmental support in the management of kidney disease as the cost of treatment is enormous.

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AUTHORS' CONTRIBUTIONS

All the authors contributed equally to the development of concept, data collection and writing of the manuscript.

CONFLICT OF INTEREST

None to declare

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