



Renal Cell Carcinoma: A Ten-Year Review in a Tertiary Institution in the Niger Delta.

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ABSTRACT

Background: Renal cell carcinoma (RCC) is an insidious neoplasm, accounting for approximately 2% of global cancer diagnoses and deaths, and is projected to increase in burden worldwide. Studies on renal malignancies in Port Harcourt are few and where present have focused on the pathology or the paediatric population. This study is on the presentation, risk factors and management of RCC in an adult population. **Materials and Methods:** This is a ten-year retrospective study conducted at the University of Port Harcourt Teaching Hospital. Ethical approval for the study was sought and obtained from the hospital's ethical committee. The information gotten included symptoms, number of cases per year, the side affected, stage of disease, risk factors, treatment received, prognosis, neoadjuvant and adjuvant treatment. The data were collected and evaluated. Frequencies, percentages, the mean and standard deviation were used to summarize the data as appropriate. **Results:** The hospital incidence of RCC is 98/100,000 at UPTH. The disease was more common from the third to the fifth decade and commoner in females and on the left kidney. The disease has increased in incidence over the years. Haematuria was the most common symptom and radical nephrectomy was the most common form of treatment. Most patients presented with advanced disease and this affected prognosis. **Conclusion:** RCC is rare but its incidence is increasing in Port Harcourt. Many patients presented with an advanced disease which led to poor prognosis. Open radical prostatectomy was the most common form of treatment.

INTRODUCTION

Renal cell carcinoma (RCC) was previously known as hypernephroma since it was erroneously believed to originate in the adrenal gland. Renal cell carcinoma (RCC) is an insidious neoplasm, accounting for approximately 2% of global cancer diagnoses and deaths, and its burden is projected to increase worldwide.¹ Males are more affected than females; the peak incidence of sporadic RCC is between 60–70y of age.^{2,3} The GLOBOCAN 2020 report states that the incidence of RCC is highest in North America, followed by Europe and least in Asia and Africa.⁴

Smoking, obesity, hypertension, and chronic kidney disease represent established risk factors while behavioural and environmental factors, comorbidities, and analgesics are potential risk factors.⁵ Alcohol and physical activity seem to be protective of RCC.⁶ Renal cell carcinoma is classified mainly into clear cell RCC, papillary RCC (types 1 and 2), chromophobe RCC, and other renal cell tumours.⁶ Advances in the genetic characterization of these cancers have led to a better understanding of the germline and somatic mutations that predispose patients to the development of cancers, with the potential for the identification of therapeutic targets that may improve outcomes for patients at risk.^{7,8,9}

Patients with renal cell carcinoma may be asymptomatic or symptomatic. Symptomatic patients present with haematuria, loin pain and a palpable mass. When all three symptoms are present it is termed the too-late triad and occurs in 10% of patients.² RCC is one malignancy that is diagnosed and staged with imaging such as Computerized Tomography CT scan, Magnetic Resonance Imaging MRI and Positron Emission Tomography PET.^{1,2,10} RCCs are usually resistant to chemotherapy and radiotherapy.¹¹ Treatment of RCC depends on the stage, life expectancy, and facilities available. Treatment of RCC is usually via surgery and the use of targeted therapy.^{2,8}

Studies on renal tumours are few in Port Harcourt, Rivers State, Nigeria. Seleye Fubara et al.¹² and Obiora et al.¹³ focused more on the pathology of renal tumours. Gbobo and Abbulimen¹⁴ focused on the clinical aspect of renal tumours but in the paediatric population alone. This study is on the presentation, risk factors and management of RCC in an adult population.

MATERIALS AND METHODS

This was a retrospective study. All patients who presented with features suggestive of renal malignancy between January 2013 and December 2022 at the University of Port Harcourt Teaching Hospital UPTH were included in the study. Ethical approval for the study was sought and gotten from the hospital's ethical committee.

Port Harcourt is a Major oil-producing city located in Southern Nigeria. It is also home to illegal oil refining after crude oil theft. In Nigeria, during oil refining natural gases are flared during oil production.

Data from all patients listed in the medical records department as having been treated for renal malignancy during the study period were retrieved. Also, data were obtained from ward admission registers, theatre, and discharge records. The information gotten included history, duration of symptoms, age of the patient, sex, side, stage, treatment received, histologic subtype, and prognosis. Patients below 16 years were excluded from the study. Patients with xanthogranulomatous pyelonephritis, renal abscess and pyonephrosis were excluded from the study. Patients who had an exploration but a nephrectomy could not be performed were excluded from the study. Patients with incomplete records and those without histology were excluded. Each patient had a computerized tomography scan to stage cancer, urinalysis/ microscopy culture and sensitivity, full blood count, electrolyte urea, and creatinine before surgery.

Patients with inoperable tumours had neoadjuvant treatment using a tyrosine kinase inhibitor, Sorafenib and some patients had surgery after response to Sorafenib. These patients were closely followed up after surgery. Patients with incomplete tumour resection also had sorafenib for 6 months after surgery. Some patients had PET/CT scans for follow-up.

The data from the folders were collected and entered using Microsoft Excel 2016 version and transferred into the statistical package for social sciences (SPSS) for windows (version 25) (IBM SPSS Inc. Chicago, IL) for analysis. A ninety-five per cent confidence interval and a p-value less than 0.05 was considered significant. Frequencies, percentages, mean and standard deviation were used to summarize the data as appropriate. Categorical data were presented in the form of frequencies and percentages using tables. Continuous variables were presented in means and standard deviation. Results were presented in tables and charts.

RESULTS

During the study period, 39,813 patients presented to the urology unit but 39 patients had histologically confirmed RCC, giving a hospital incidence of RCC to be 98/100,000. The mean age of the patients was 41.43 ± 16.91 years and the median age was 40 years. The age of the study population ranges from 17 to 81 years. Table 1 shows the sociodemographic distribution of the study group. The incidence of RCC increases with age and reaches a climax between the 20 to 49 age groups. Thereafter the incidence decreases with an increase in the age of the patients. The lowest incidence of RCC was found in those <20 years of age.

Females 22(56.4%) were also more affected than males.

Table 1. Sociodemographic distribution of the study group

Sociodemographic variables	N	(%)
Age group		
<20	3	(7.7)
20-29	8	(20.5)
30-39	8	(20.5)
40-49	8	(20.5)
50-59	7	(17.9)
>60	5	(12.8)
Sex		
Male	17	(43.6)
Female	22	(56.4)
Total	39	(100.0)

Table 2 shows the frequency of RCC each year

Year	Frequency (n)	Percentage (%)
2013	1	2.57
2014	0	0
2015	0	0
2016	1	2.57
2017	1	2.57
2018	3	7.69
2019	4	10.26
2020	7	17.94
2021	9	23.07
2022	13	33.33
Total	39	100

There was a gradual increase in the incidence of RCC from 2013 to 2022

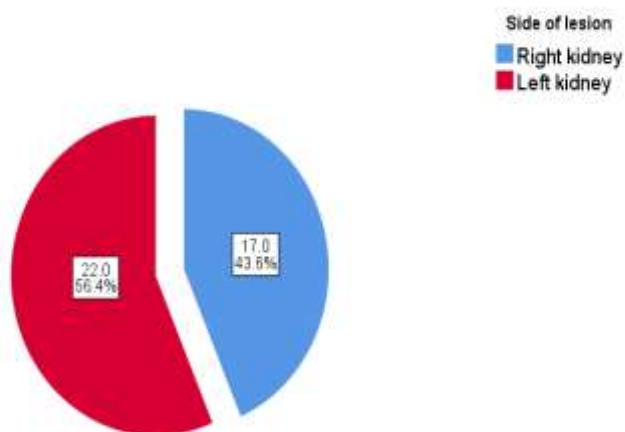


Figure 1 shows the side affected by RCC. The left kidney was more affected by RCC compared to the right as shown in figure 1. None of the patients in this study had bilateral RCC.

Table 3. Distribution of risk factors

		N	%
Immunosuppression	No	34	87.2
	Yes	5	12.8
Obesity	No	32	82.1
	Yes	7	17.9
Tobacco	No	31	79.5
	Yes	8	20.5
Hypertension	No	25	64.1
	Yes	14	35.9
Family History	No	36	92.3
	Yes	3	7.7
No known risk factor	No	25	64.1
	Yes	14	35.9

Table 3 shows the risk factors associated with RCC, hypertension (35.9%) was the most commonly identified risk factor in this study followed by tobacco smoking,

obesity and immunosuppression. Family history (7.7%) was the least risk factor recorded among the patients. Many patients had no identified risk factor.

Table 4: Clinical Features

Clinical features	Frequency (n)	Percentage (%)
Haematuria, loin pain and loin mass	10	25.64
Haematuria and loin mass	4	10.26
Haematuria and weight loss	8	20.51
Loin mass and pain	10	25.64
Haematuria alone	5	12.82
Asymptomatic	2	5.13
Total	39	100

Table 4 shows the clinical features of patients who presented with RCC. Ten (25.64%) patients presented with haematuria, loin pain and loin mass. Haematuria

was the most common symptom and was found in 27 (69.23%) patients. Only two patients presented without symptoms.

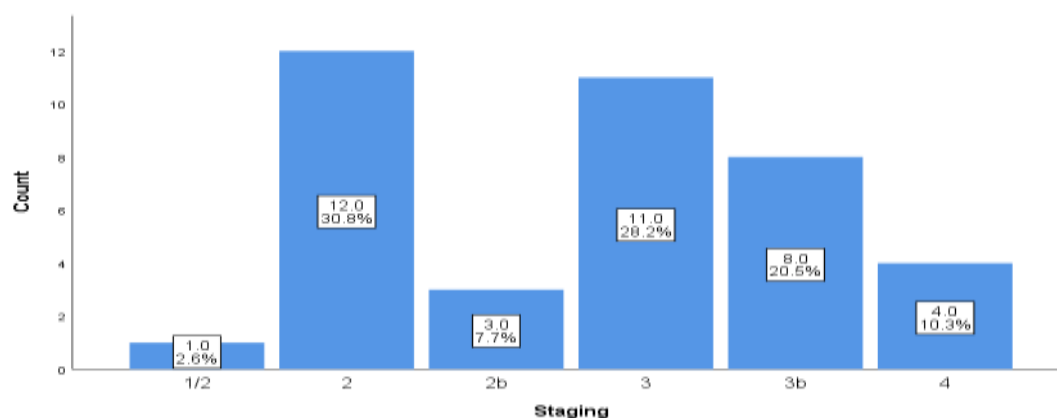


Figure 2 shows the staging of patients with RCC. Most (48.7%) patients presented with stage 3 disease as shown in figure 2 with 28.2% having stage 3a and 20.5% having stage 3b. the least was stage 1 with 2.6%.

Table 5: Types of surgical treatment received

Treatment	N	%
Radical nephrectomy	37	94.9
Partial nephrectomy	2	5.1
Total	39	100.0

Thirty-seven (94.9%) of the patient had radical nephrectomy while 2 (5.1%) had partial nephrectomy as shown in Table 3.

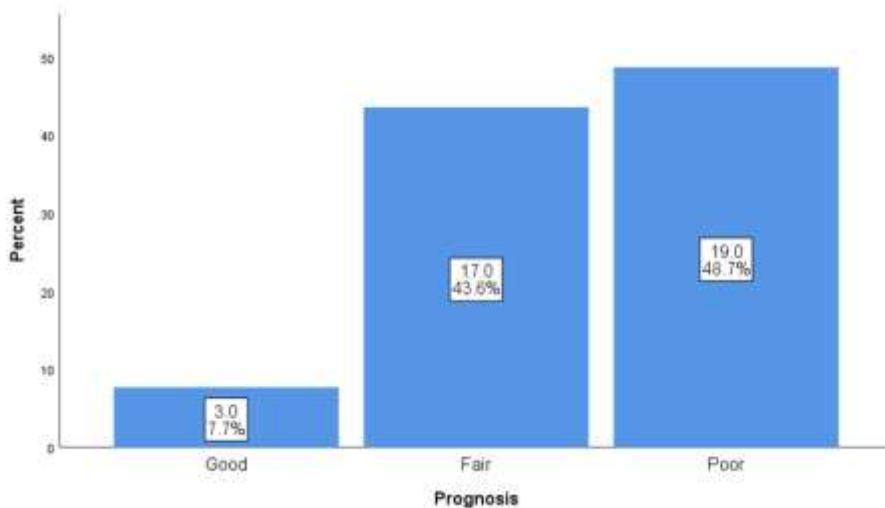


Figure 3 shows the prognosis of patients with RCC. Most patients (48.7%) had poor prognoses.

Table 6: Association of surgical treatment and prognosis

Prognosis	Treatment			
	Radical nephrectomy		Partial nephrectomy	
	n	(%)	n	(%)
Good	1	(2.7)	2	(100.0)
Fair	17	(45.9)	0	(.0)
Poor	19	(51.4)	0	(.0)
Total	37	(100.0)	2	(100.0)

P<0.001

Table 6 shows that the two patients who had partial nephrectomy had a 100% good prognosis compared to 2.7 % of those who had a radical nephrectomy. This was statistically significant with a p-value < 0.001.

Table 7: association of use of adjuvant and prognosis

		Prognosis						Fishers exact p-value
		Good		Fair		Poor		
		N	(%)	N	(%)	N	(%)	
Neo Adjuvant	No	2	(8.7)	15	(65.2)	6	(26.1)	0.006
	Yes	1	(6.3)	2	(12.5)	13	(81.3)	
Adjuvant treatment	No	3	(27.3)	6	(54.5)	2	(18.2)	0.001
	Yes	0	(.0)	11	(61.1)	7	(38.9)	
	NA	0	(.0)	0	(.0)	9	(90.0)	

Table 7 shows that patients who required neoadjuvant chemotherapy had poorer prognoses (81.3%) compared to 26.1% of those without neoadjuvant therapy and this was statistically significant ($p=0.006$). Likewise, those without adjuvant therapy had a better prognosis compared to those with adjuvant therapy.

Table 8: Association of histologic subtypes and prognosis

Prognosis							Fishers exact p-value
Histologic subtypes	Good		Fair		Poor		
	N	(%)	N	(%)	N	(%)	
	Chromophobe	0	(.0)	4	(80.0)	1	(20.0)
	Clear cell carcinoma	3	(14.3)	9	(42.9)	9	(42.9)
Papillary	0	(.0)	4	(30.8)	9	(69.2)	

Table 8 shows that three (14.3%) of the patients with clear cell RCC had good prognoses compared to none in chromophobe and papillary subtypes. Patients with the papillary subtype of RCC had poorer prognoses (69.2%) compared to 42.9% of clear cell subtypes and 20.0% of chromophobe subtypes of RCC as shown in Table 6. The association between histologic subtypes and the prognosis was not statistically significant.

Table 9: Association of RCC staging and prognosis

Table 1. Association of REC staging and prognosis							Fishers exact p-value
Staging	Prognosis						p-value
	Good		Fair		Poor		
	N	(%)	N	(%)	N	(%)	
1	0	(.0)	1	(100.0)	0	(.0)	0.0001
2a	1	(8.3)	11	(91.7)	0	(.0)	
2b	2	(66.7)	1	(33.3)	0	(.0)	
3a	0	(.0)	1	(9.1)	10	(90.9)	
3b	0	(.0)	3	(37.5)	5	(62.5)	
4	0	(.0)	0	(.0)	4	(100.0)	

Table 9 shows that as the stage of the disease increased the prognosis worsened. The association between RCC staging and prognosis was statistically significant.

Table 10: Association of RCC staging and histologic subtypes

Stage	Histologic Subtypes					
	Chromophobe		Clear Cell Carcinoma		Papillary	
	N	(%)	N	(%)	N	(%)
1	0	(.0)	1	(100.0)	0	(.0)
2a	2	(16.7)	6	(50.0)	4	(33.3)
2b	1	(33.3)	2	(66.7)	0	(.0)
3a	2	(18.2)	4	(36.4)	5	(45.5)
3b	0	(.0)	6	(75.0)	2	(25.0)
4	0	(.0)	2	(50.0)	2	(50.0)

P=0.704

Table 10 shows that the majority of those stages 1, 2a, 2b and 3b had clear cell subtypes. However, most of those with stage 3a had the papillary subtype of RCC. An equal proportion of those with stage 4 had clear cell

and papillary subtypes as shown in Table 7. The association between RCC staging and histologic subtypes was not statistically significant with $p=0.704$.

Table 11: Association of prognosis with age group, gender and risk factors

		Prognosis						p-value
		Good		Fair		Poor		
		N	(%)	N	(%)	N	(%)	
Age group	<20	1	(33.3)	1	(33.3)	1	(33.3)	0.229
	20-29	0	(.0)	6	(75.0)	2	(25.0)	
	30-39	1	(12.5)	4	(50.0)	3	(37.5)	
	40-49	0	(.0)	3	(37.5)	5	(62.5)	
	50-59	1	(14.3)	3	(42.9)	3	(42.9)	
	>60	0	(.0)	0	(.0)	5	(100.0)	
Sex	Male	1	(5.9)	4	(23.5)	12	(70.6)	0.055
	Female	2	(9.1)	13	(59.1)	6	(27.3)	
Side of lesion	Right	1	(5.9)	7	(41.2)	9	(52.9)	0.743
	Left	2	(9.1)	10	(45.5)	10	(45.4)	
Immunosuppression	No	3	(8.8)	16	(47.1)	15	(44.1)	0.433
	Yes	0	(.0)	1	(20.0)	4	(80.0)	
Obesity	No	3	(9.4)	14	(43.8)	15	(46.9)	0.777
	Yes	0	(.0)	3	(42.9)	4	(57.1)	
Tobacco	No	3	(9.7)	16	(51.6)	12	(38.7)	0.072
	Yes	0	(.0)	1	(12.5)	7	(87.5)	
Hypertension	No	1	(4.0)	13	(52.0)	11	(44.0)	0.321
	Yes	2	(14.3)	4	(28.6)	8	(57.1)	
Family History	No	3	(8.3)	16	(44.4)	17	(47.2)	0.006
	Yes	0	(.0)	1	(33.3)	2	(66.6)	
No known risk factor	No	2	(8.0)	7	(28.0)	16	(64.0)	0.062
	Yes	1	(7.1)	10	(71.4)	3	(21.4)	

Table 11 shows the association of prognosis with age group, gender and risk factors. The prognosis of RCC was poor with increases in age group, however, this was not statistically significant. Male patients had a poorer prognosis of 70.6% compared to their female counterparts 27.3%, also, this was not statistically significant ($p = 0.055$). Those with lesions on the right kidney had poorer prognoses than those with left-sided lesions. A higher proportion of patients with risk factors

(immunosuppression (80.0%), tobacco smoking(87.5%), obesity (57.1%), hypertension(57.1%) and 66.6% of those with a family history) had a poorer prognosis compared to those without the risk factors. However, these were not statistically significant except for family history with $p = 0.006$. Those with known risk factors had poorer prognoses (64.0%) compared to 21.4% of those with no known risk factors.



Figure 4: A patient with RCC with a large left loin mass. Patients in Nigeria tend to present when the cancer is at an advanced stage.



Figure 5: showing the mass removed from the patient in Figure 4.

DISCUSSION

RCC is the most fatal urological malignancy and is responsible for 1.8% of all cancer deaths.¹⁵ However, it is believed to be rare in Nigeria.¹⁶ The hospital incidence of this disease is 98/100,00 in this study. Early diagnosis and treatment will help improve the outcome of this disease. The mean age in this study was 41.43 years and the median age was 40 years as shown in **Table 1**. Globally, the mean age at diagnosis was 60 to 70 years.^{17,18} However, in Africa the mean age varies, the mean age at Enugu, South Eastern Nigeria was 44 years,¹⁹ while the mean age at Nnewi was 52.6 years.²⁰ The median age was 41.7 years at Ile-Ife,²¹ and 41.8 years at Lagos, South Western Nigeria.²² A systematic review on renal cell carcinoma conducted by Atanda et al.¹⁶ has an average mean age across different regions of the country of 44.61 years. This mean age of 44.61 is close to ours of 41.7 years. The reason for the elevated mean age of 52.6 years at Nnewi is unknown. However, Gueye et al. in Senegal had a similar mean age of 51 years.²³ **Table 1** shows an increase in the incidence of RCC from less than 20 years to a plateau at 20-29, 30 -39 and 40 – 49 years



Figure 6: Patient with right upper pole RCC, note the functional residual lower pole kidney.

before a gradual decline after 49 years. This decline may be connected to the fact that the average life expectancy of the Nigerians is 53 years.²⁴ Atanda et al.¹⁶ feel that exposure of younger Africans to hazardous work environments may lead to this disease being common in the younger age group. The male-to-female ratio in this study is 1: 1.29 as shown in **Table 1**. This study had 22 females and 17 males. Globally, RCC is commoner in men.^{24,25} The male-to-female ratio at Ile-Ife was 1:1.5.²¹ Salako et al.²¹ noticed a slight female preponderance also. A systematic review carried out in Sub-Saharan Africa by Cassell et al.²³ reveals that the incidence of RCC in females is more than in males in various studies conducted across Nigeria, Togo, Senegal, Benin and Burkina Faso. A Nigerian study published 23 years ago by Aghaji et al.¹⁹ and a study conducted in Benin republic by Avakoudjo et al.²⁶ records a slight male preponderance.

A gradual increase in the incidence of RCC was also noted from 2013 to 2022 in this study as shown in **Table 2**. Padala et al.¹ noted that even if the incidence of RCC is low in Africa now, they predicted a rise in its incidence. This gentle rise may be that predicted by Padala. Other reasons for this increase may be due to

the increase in illegal refining and production of diesel (kpo fire) in and around Rivers state from around 2016, which led to the production of harmful gases (black soot) which were inhaled by residents.^{27,28,29,30} Mandel et al.³¹ have also noted an association between refining crude oil and RCC. Atanda et al.¹⁶ noticed that smoking is a risk factor in the development of RCC, residents in Rivers state who inhale the soot daily may be seen as passive smokers. The purchase of new CT scan machines installed in the hospital in 2018 may also be a factor in the increased detection of RCC. With the use of the CT scan machine, it became easier to diagnose and stage RCC compared to the use of Intravenous Urography.^{23,32,33} The ease of diagnosing RCC may also be a reason for the increased incidence of RCC. The left kidney was more affected by RCC compared to the right as shown in **Figure 1**. Salako et al.²¹ at Ile Ife also noted a similar finding. Patients with a genetic predisposition for RCC tend to present earlier and sometimes with bilateral disease.¹ None of the patients in this study had bilateral RCC.

The male sex and age above 60 years are known risk factors associated with RCC globally.¹ Modifiable risk factors for RCC include smoking, obesity, poorly-controlled hypertension, diet and alcohol, and occupational exposures.¹ In this study many patients had no identified risk factor, hypertension (35.9%) was the most commonly identified risk factor in this study followed by tobacco smoking, obesity and immunosuppression as shown in **Table 3**. Immunosuppression from Human Immunodeficiency Virus (HIV) is an important risk factor for RCC. The immune system is important in immunosurveillance and with suppression of the immunity RCC can develop. A study conducted in Enugu noted the contribution of immunosuppression to RCC.^{16,19} Family history (7.7%) was the least associated risk factor recorded among the patients. Smoking cessation, good diet and exercise to maintain a good Body Mass Index and better control of hypertension may well reduce the incidence of RCC.^{1,2}

In many studies in Europe and Northern America, RCC is diagnosed incidentally. In Africa and many resource-poor countries of the world, the story is different. The symptoms of haematuria, loin pain and loin mass referred to as the "too late triad" and are found in less than 10 percent of patients in the developed world.² In this study, 25.64% of patients presented with this triad as shown in **Table 4**. Haematuria was the most common presentation of RCC and was found in 69.23% of patients. Renal cell carcinoma is associated with the elaboration of vascular endothelial growth factors. This results in neovascularization and consequent haematuria since these vessels are friable and bleed easily.³⁴ Abbulimen et al.^{34,35} in a study on haematuria conducted in Port Harcourt, Rivers state noted that thorough evaluation of patients with haematuria and proper management will help diagnose patients with RCC and other causes of surgical haematuria earlier.^{34,35}

Renal malignancy is associated with neovascularization and is diagnosed when contrast attenuation of 10–20 Hounsfield Unit (HU) is noted on a contrast-enhanced CT scan.³⁶ CT scan is also essential for staging, lymph node assessment, and identification of metastasis.^{23,36} Management of RCC is stage dependent. The staging of patients in this study was done using a CT scan. Most (48.7%) patients presented with stage 3 disease as shown in **Figure 2** with 28.2% having stage 3a and 20.5% having stage 3b. The least was stage 1 with 2.6%. There is a clear association between disease stage and prognosis as seen in **Table 9**. Numerous other African and Nigerian studies have noted the presentation at an advanced stage.^{16,19,20-23} The reasons for the presentation at an advanced stage include late presentation,^{21,22,37,38,39} and poor health-seeking behaviours of Africans.^{40,41,42} In Europe and North America many patients present with earlier-stage RCC and are diagnosed incidentally during a routine scan for an unrelated event.^{22,23,1,2} One patient in this study was diagnosed while she was being investigated for a missing intrauterine contraceptive device.

For localized non-metastatic RCC, surgical excision remains the most effective form of treatment since these tumours are usually radio and chemoresistant.^{2,18} Radical Nephrectomy is the gold standard in the treatment of localized RCC,¹⁸ but it involves removal of both normal and cancerous renal tissue which can affect overall kidney function. A partial Nephrectomy involves the removal of the diseased part of the kidney and a rim of normal tissue. Recent studies have shown that for well-selected patients there is no oncological advantage in carrying out a radical nephrectomy.^{43,44} In our study most of the nephrectomies were radical except in two cases as shown in **Table 5**. Nephrectomy can be open, laparoscopic or robotic. In our study, all the procedures were carried out using the open transperitoneal approach. Multimodal pain therapy was employed to reduce post-operative pain.⁴⁵

Prognostic factors in RCC include TNM stage, histological subtype, Fuhrman grade, clinical symptoms and performance status of patients.^{46,47} Most patients (48.7%) had poor prognoses as shown in **Figure 3**. The late presentation of patients with advanced disease may be the reason for the poor prognosis. Patients whose RCC was diagnosed incidentally and sought treatment early had good prognoses probably because they presented early with T1 stage disease. They were also amenable to partial nephrectomy as seen in **Table 6**. Figures 4 and 5 show patients who presented late. Patients with locally advanced diseases who required adjuvant therapy also had a statistically significant poorer prognosis as seen in **Table 7**. This is probably because surgery is the only treatment for RCC that is curative. Other forms of treatment are supportive. The most common histologic subtype in this study was the clear cell RCC. Several other African studies noted similar findings.^{16,19,22,23} Patients with clear cell

carcinoma had better prognoses compared to other subtypes but this association between histologic subtypes and the prognosis was not statistically significant as shown in **Table 8**. This study reveals that older age, male sex and right-sided tumour were associated with poorer prognosis but this was not statistically significant as shown in **Table 11**. Patients with known risk factors also had a poorer prognosis compared to those without risk factors and this was not statistically significant except for statistically significant family history. The older the patient is the less fit he or she is for prolonged extensive radical surgeries. This may be the reason why patients with older age have poorer prognoses. Right-sided tumours are technically more difficult to handle especially advanced-stage tumours. The right kidney is close to the inferior vena cavae and there is a risk of inadvertent injury to this structure. So careful retraction and sometimes less extensive surgeries are performed on the right than on the left. These may be the factors that lead to a poorer prognosis on the right than the left.

Adjuvant therapy aims to reduce the incidence of recurrent disease and cure patients. Patients with larger tumours and higher-grade cancers are at an increased risk of recurrence.⁴⁸ Adjuvant therapy could be before nephrectomy in which case it is termed neoadjuvant therapy. Neoadjuvant therapy in this study was sometimes needed for patients with advanced disease and made some unresectable tumours resectable. Patients with incomplete tumour resection or histological reports showing a breach of the Gerota's fascia or metastatic lymph nodes that were not resectable at the time of surgery had adjuvant therapy. These drugs are important and have improved the quality of life and increased the life expectancy of some patients.^{49,50} These drugs are also very expensive and may be out of reach of the ordinary African.²³ Adjuvant therapy has moved from the cytokine era, vascular endothelial growth factors inhibitors to tyrosine kinase inhibitors. In our centre, we use sorafenib because it is relatively readily available and cheaper. Sunitinib is more expensive than sorafenib in Nigeria. These drugs are also not without complications. The common complications with these drugs include hypertension, fatigue, diarrhoea, hand-foot syndrome, and stomatitis.⁵¹ One patient in this study had a cerebrovascular accident 2 days after the commencement of sorafenib.

CONCLUSION

RCC is rare but its incidence is increasing in Port Harcourt. The disease is common from the second to fifth decade. Females were more affected than males. The left side was more commonly affected. Many patients presented with an advanced disease which led to poor prognosis. Clear cell carcinoma was the most common subtype and had the best prognosis. Open

radical prostatectomy was the most common form of treatment.

Recommendations

Proper evaluation and treatment of haematuria, since haematuria was the most common symptom. Better health-seeking behaviours of Africans. If sick Africans presented to the hospital first, the prognosis may be better.

Limitations of the study

This was a retrospective study and this affected the sample size since patients with incomplete records were excluded from the study.

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Conflicts of Interest

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