Original Article

Genitourinary malignancies in Port Harcourt, Nigeria

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Abstract

Background: The prevalence of genitourinary malignancies has been found to be increasing in most centres in Nigeria and worldwide. Petroleum and gas explorations have been associated with some genitourinary cancers. Port Harcourt is a major city in the oil and gas exploration zone in Nigeria.

Aim: This study aimed to determine the prevalence and pattern of genitourinary malignancies at the University of Port Harcourt Teaching Hospital, Port Harcourt.

Methods: A 7-year retrospective study spanning between January 2005 and December 2011 was carried out to document the frequency and pattern of genitourinary malignancies in patients above 16 years of age in the University of Port Harcourt Teaching Hospital. Data were retrieved from patients' case notes, histopathology reports and theatre registers. Information retrieved included gender, age, organ involved and the histologic type. Analysis was done using Statistical Package for Social Sciences version 20.0.

Results: A total of 477 cases were isolated. Adenocarcinoma of the prostate was the most common genitourinary malignancy in the region (86.8%), followed by bladder cancer (6.5%) and then malignant renal tumours. The median age for prostate cancer was 67.8 ± 10.3 years, bladder cancer was 58.0 ± 15.6 years and malignant renal tumour was 41.0 ± 19.9 years. Malignant renal tumour had an early peak in the 21–30 years' age range. Transitional cell carcinoma accounted for 83% of bladder cancer. Papillary cell type was the most common renal cell carcinoma seen.

Conclusion: There are observed differences in the age of presentation of prostate and renal cancers in this region. The histologic pattern of renal cancer is also different from the pattern observed elsewhere.

Keywords: Exploration, genitourinary, malignancy, oil

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INTRODUCTION

Cancer constitutes a major health burden globally. An analysis of various cancer registries in Nigeria has revealed an increased incidence of cancers.[1,2] Notable especially is the rate of increase of prostate cancer. Ogunbiyi *et al.* in Ibadan, South West Nigeria, compared the prevalence of the most common cancers in the region over two different periods (1980–1988 and 1989–1996) and found that prostate cancer had become the most common male cancer in Nigeria.[1] In Kano, in the northern part of Nigeria, between 1995 and 2004, prostate and bladder cancers, respectively, were ranked the third and sixth most common cancers in both sexes combined and first and second most common cancers in males.[2] In other African countries such as Ghana,[3] Cameroun[4] and South Africa,[5] the experience is

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similar. Worldwide, renal cancer has been documented as the third most common genitourinary cancer.[3,4]

Different aetiological factors, including genetic, high testosterone and increasing age among others, have been cited for the increasing incidence of prostate cancer.[1,2] Urbanisation, industrialisation and increasing cigarette smoking[5] have been identified as the contributing factors for the increasing incidence of transitional cell carcinoma (TCC) of the bladder in some developing African countries[5] while *Schistosoma haematobium* endemicity has been implicated for the high prevalence of squamous cell carcinoma (SCC) of bladder in others.[2,3] The association between kidney cancer and occupational exposure has not been clearly defined. However, a number of occupational agents and exposure scenarios have been associated with renal cell cancers including oil refining and gasoline/diesel delivery and polycyclic aromatic hydrocarbon pollutions.[6-9] Port Harcourt is located in the Niger Delta, the oil and gas exploration zone of Nigeria with over six decades of experience of hydrocarbon pollution. An average of 300 major oil spillages are said to take place in the Niger Delta every year, spilling approximately 2300 m^3 of crude oil into the environment.[10] We are not aware whether the pattern of genitourinary cancer has been documented in this region. Therefore, the aim of this study is to review and document the frequency and pattern of genitourinary malignancies in Port Harcourt.

METHODS

This was a retrospective study undertaken in the urology division of the University of Port Harcourt Teaching Hospital. We retrieved data of all cases of genitourinary malignancies that were managed in our facility between January 2005 and December 2011. Data were retrieved from patients' case notes, histopathologic records and theatre registers. Information collected included patients' gender, age, organ involved and histologic type. Results were presented in tables and graphs. Analysis was done using Statistical Package for Social Sciences version 20.0 (2007, version 20.0, IBM SPSS Inc, Chicago, I, USA).

RESULTS

A total of 477 patients were seen within the period. Cancer of the Prostate was seen in 414 patient (86.8%), cancer of the bladder in 31 (6.5%), renal tumours in 27 (5.7%), testicular tumours in 3 (0.6%), scrotal cancer in 1 (0.2%) and cancer of the penis in 1 patient (0.2%) [Table 1].

The number of males and females was 459 (96.2%) and 18 (3.8%), respectively. The peak age range for all genitourinary malignancies combined was 61–70 years (34.50%), with a mean age of 65.52 ± 13.26 years [Table 2]. Prostate cancer was the most common, constituting 414 (86.8%) of all cancers of the genitourinary tract, followed by bladder cancer with 31 (6.1%) patients and then renal cancer with 27 patients (5.7%). Testicular cancer was the fourth with three (0.6%) patients. Cancer of the penis and scrotum constituted one patient (0.2%) each.

The peak age range for prostate cancer was 61–70 years, with a mean age of 67.8 ± 10.38 years. Of the 31 patients who had bladder cancer, males were 27 (86.7%) while females were 4 (13.3%), with a male-female ratio of 6.5:1. The peak age range for bladder cancer was 51–60 years, with a mean age of 58 ± 15.6 years. Of the 26 patients who had renal cancer, 15 (55%) were males while 12 (45%) were females, with a male-female ratio of 1:0.8. The peak age range for renal cancer was 21–30 years, with a mean age of 42.8 ± 19.4 years [Table 3].

Adenocarcinoma was the most common histologic type of prostate cancer constituting 99.5% of patients. The most

Table 1: Frequency distribution of the various genitourinary malignancies

	Frequency (%)
Kidney	27 (5.7)
Bladder	31 (6.5)
Prostate	414 (86.8)
Testis	3 (0.6)
Penis	1 (0.2)
Scrotum	1 (0.2)

Table 2: Age and gender characteristics of the patients and the organ of origin of the tumours

Organ involved	Gender		Mean age (years)	Peak age range (years)
	Male	Female		
Kidneys	15	12	42±19.94	21-30
Bladder	27	4	58±19.63	51-60
Prostate	414	-	67.80±10.38	61-70
Testis	3	-	40.0±11.5	-
Penis	1	-	68	-
Scrotum	1	-	70	-

Table 3: Comparative age group distribution for patients with more common genitourinary tumours

Age range (years)	Renal cancer, *n* (%)	Bladder cancer, *n* (%)	CAP, *n* (%)
11-20	2 (7.7)	0	0
21-30	10 (38.5)	1 (3.2)	2 (0.5)
31-40	2 (7.7)	3 (9.7)	4 (1.0)
41-50	2 (7.7)	5 (16.1)	23 (5.6)
51-60	4 (15.4)	9 (29.0)	71 (17.1)
61-70	3 (11.5)	8 (25.8)	151 (36.5)
71-80	3 (11.5)	3 (9.7)	128 (30.9)
81-90	0	2 (6.5)	31 (7.5)
91-100	0	0	4 (1.0)

common histologic type of bladder cancer was transitional cell cancer. Renal cell carcinoma (RCC) was the most common histologic type of renal tumours comprising about 76% of patients. Of RCC, papillary cell was the most common subtype (50%) followed very closely by clear cell type (45%). Seminoma comprised two (66.7%) of the three testicular cancers. The other was teratoma. The one each penile and scrotal cancers were squamous cells [Table 4].

Figure 1 compares the age group presentation of common genitourinary cancers.

The yearly frequency distribution of cancer of the prostate showed a rise from 50 (10.4%) in 2005 to a peak of 77 (16.0%) in 2007, a plateau in 2008 and then a gradual decline to 49 (10.2%) in 2011 [Figure 2].

Table 4: The histologic pattern of the various cancer types

Organ involved	Total number of cases	Histological types	*n* (%)
Kidney	27	RCC	20 (74.1)
		Papillary	10 (50)
		Clear cell	9 (45)
		Collecting duct	1 (5)
		Nephroblastoma	2 (7.4)
		Squamous cell	1 (3.7)
		Rhabdomyosarcoma	3 (11.1)
		TCC	1 (3.7)
Bladder	31	TCC	26 (83.9)
		SCC	4 (12.9)
		Suggestive of malignancy	1 (3.2)
Prostate	414	Adenocarcinoma	412 (99.5)
		Neuroendocrine	1 (0.02)
		Squamous cell	1 (0.02)
Testis	3	Seminoma	2 (66.7)
		Teratoma	1 (33.3)
Penis	1	Squamous cell	1 (100)
Scrotum	1	Squamous cell	1 (100)

RCC: Renal cell carcinoma, TCC: Transitional cell carcinoma, SCC: Squamous cell carcinoma

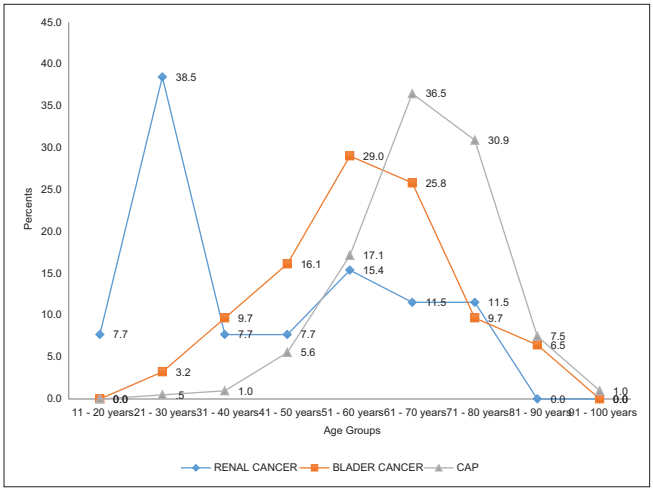

Figure 1: Graph comparing age group presentation of the common genitourinary malignancies

DISCUSSION

From the findings of this study, it can be demonstrated that cancer of the prostate is the most common genitourinary cancer in Port Harcourt, South-South Nigeria. This corroborates with the finding in Calabar,[11] another centre in South-South Ibadan,[1] South West Nigeria and other parts of West Africa such as Ghana[3] and Cameroun.[4]

Prostate cancer has now been also documented as the most common cancer among males in Nigeria.[1,12] Before now, prostate cancer was said to be uncommon among Africans in West Africa. in West Africa,[13] but over four decades it has become the most common cancer among males in Nigeria, surpassing cancer of the liver. [1]

The mean age of patients with prostate cancer in this study was 67.8 ± 10.3 years. This was different from an earlier mean age of 71.6 years reported by Eke and Sapira[14] from this centre more than a decade from the time of this study. The reduction in age in this study may be related to the introduction of the use of serum prostate-specific antigen (PSA) at this time. Serum PSA is said to diagnose prostate cancer at an earlier age.[15] It was however similar to the mean age of 66.6 ± 9.8 years observed by Ekwere and Egbe[11] in Calabar, another centre in the Niger Delta region. Ekwere and Egbe had established a statistical significance between the age of presentation of prostate cancer in this region and the mean age of 71.4 ± 14.3 years observed in the western part of Nigeria by Ogunbiyi and Shittu.[1] Sapira *et al.*[16] in a more recent study also observed a statistical difference in age between prostate cancer patients from the Ijaw (67.2 ± 6.2 years) and Ogoni (66.2 ± 5.5 years) on the one hand and the Igbo (71.1 ± 5.5 years) on the other hand. Ijaws and Ogonis are major tribes in the Niger delta region and constitute a good percentage of patients seen

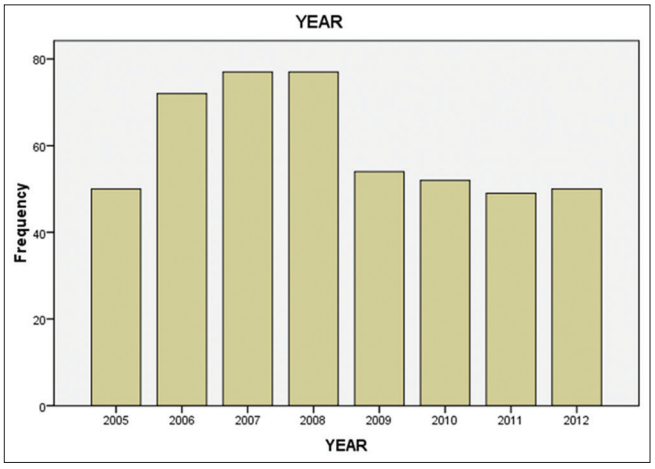

Figure 2: The yearly distribution of patients with cancer of the prostate

at this centre. The reason why prostate cancer presents at a younger age in this region is yet to be explained.

Bladder cancer was the second most common genitourinary malignancy seen in this region. This also followed the trend observed by Klufio[2] in Ghana and Sow *et al.*[3] in Cameroun. TCC was, however, the most common histologic type observed in our centre constituting more than 80% of cases. TCC is the most common histologic type of bladder cancer worldwide and is so in this region of the country because *S. haematobium* infection is rarely seen here. This is a departure from a decade experience in Ibadan where SCC was seen more commonly until a changing pattern from squamous to transitional cell was observed.[4] In Egypt where schistosomiasis is still endemic, SCC is the prevalent cell type.[5] The male:female ratio of 5.6:1 observed here for bladder cancer is higher than the usually quoted ratio of 2.5:1 or 3:1. Tobacco is a very potent aetiological factor for bladder cancer.[17] Since religious and cultural inhibitions on women in this region discourage cigarette smoking, the number of women exposed to tobacco is much less compared to men. Besides, men are occupationally more exposed to aromatic hydrocarbons in the oil and gas industries. Bladder outlet obstruction (which increases contact time of irritants with bladder mucosa) is also more common in males in this age group.

RCC was the most common cell type in this region. Although only adult population was considered in this study, two cases of nephroblastoma were seen at 18 and 20 years, respectively. A study in Ghana where all age groups were considered observed nephroblastoma as the most common cell type seen.[2] The mean age of presentation for malignant renal tumours of 42.8 ± 19.4 years seen here is lower than the mean age of 44 years seen at Enugu,[18] 47.5 years at Ile Ife[19] and 48 years at Ibadan.[20] Most of the tumours here also presented at the third decade. The reasons for these are not immediately apparent. The reason for the preponderance of the papillary cell type in this study is not also apparent. The clear cell has often been quoted as the most common type of RCC. Petroleum and gas explorations have been variously associated with the risk of renal cancers.[6-9] Whether the increased hydrocarbon pollution in this subregion will be responsible for observed differences needs to be tested in a prospective, multicentre clinical trial.

A rise in the incidence of prostate cancer was noticed in this study from 2005 with a peak in 2007 and 2008, and then a gradual decline. The University of Port Harcourt Teaching Hospital moved to its permanent site in 2006. A fall in incidence associated with the logistics of relocation of the hospital would have been expected. This paradox may therefore suggest that the facility became more accessible to the population with prostate cancer. However, a seemingly more eloquent reason may be the fact that the rise coincided with the introduction of PSA as an investigative tool in this hospital in the late 1990s/early 2000s. With its increased use, especially as a screening tool, undiagnosed but established cases, early cases and latent forms of the disease were detected, causing a peak in 2007/2008. The decline or 'curl effect' noted afterwards may be because most of the prevalent cases of the disease had been discovered. A similar trend was observed in the United States where the incidence of prostate cancer had peaked in 1992, about 5 years after the discovery of PSA and declined afterwards to a value similar to that obtained during the pre-PSA era.[2]

This study was limited by its retrospective nature. Difficulty in accessing the case files of some patients may have led to loss of data.

CONCLUSION

There are observed differences in the age of presentation of both prostate and renal cancers in Port Harcourt compared to other regions in Nigeria. There are also differences in the histologic pattern of renal cancer in Port Harcourt.

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Conflicts of interest
There are no conflicts of interest.

REFERENCES

1. Ogunbiyi JO, Shittu OB. Increased incidence of prostate cancer in Nigerians. J Natl Med Assoc 1999;91:159-64.
2. Mohammed AZ, Edino ST, Ochicha O, Gwarzo AK, Samaila AA. Cancer in Nigeria: A 10-year analysis of the Kano cancer registry. Niger J Med 2008;17:280-4.
3. Klufio GO. A review of genitourinary cancers at the Korle-Bu teaching hospital Accra, Ghana. West Afr J Med 2004;23:131-4.
4. Sow M, Nkégoum B, Oyono JL, Garoua, Nzokou A. Epidemiological and histological features of urogenital tumours in Cameroon. Prog Urol 2006;16:36-9.
5. Heyns CF, van der Merwe A. Bladder cancer in Africa. Can J Urol 2008;15:3899-908.
6. Boffetta P, Jourenkova N, Gustavsson P. Cancer risk from occupational and environmental exposure to polycyclic aromatic hydrocarbons. Cancer Causes Control 1997;8:444-72.
7. Jensen OM, Knudsen JB, McLaughlin JK, Sørensen BL. The Copenhagen case-control study of renal pelvis and ureter cancer: Role of smoking and occupational exposures. Int J Cancer 1988;41:557-61.
8. Brown T, Slack R, Rushton L; British Occupational Cancer Burden Study Group. Occupational cancer in Britain. Urinary tract cancers: Bladder and kidney. Br J Cancer 2012;107 (Suppl 1):S76-84.

9. Rughton L, Bagga S, Bevan R, Brown T, Cherrie J, Holmes P, *et al*. The Burden of Occupational Cancer in Great Britain: Overview Report. London: Health and Safety Executive; 2012. Available from: http://www.hse.gov.uk/cancer/. [Last accessed on 2016 Jun 16].
10. Ordinioha B, Sawyer W. Food insecurity, malnutrition and crude oil spillage in a rural community in Bayelsa State, South-South Nigeria. Niger J Med 2008;17:304-9.
11. Ekwere PD, Egbe SN. The changing pattern of prostate cancer in Nigerians: Current status in the Southeastern states. J Natl Med Assoc 2002;94:619-27.
12. Grönberg H. Prostate cancer epidemiology. Lancet 2003;361:859-64.
13. Nkposong EO, Lawani J. Primary carcinoma of the prostate in Ibadan. West Afr Med J Niger Med Dent Pract 1973;22:108-11.
14. Eke N, Sapira MK. Prostate cancer in Port Harcourt, Nigeria: Features and outcome. Niger J Surg Res 2002;4:34-44.
15. Hankey BF, Feuer EJ, Clegg LX, Hayes RB, Legler JM, Prorok PC, *et al*. Cancer surveillance series: Interpreting trends in prostate cancer – Part I: Evidence of the effects of screening in recent prostate cancer incidence, mortality, and survival rates. J Natl Cancer Inst 1999;91:1017-24.
16. Sapira MK, Eke N, Nwofor AM. Ethnicity and prostate cancer in Southern Nigeria: A preliminary report. Niger J Surg 2015;21:96-101.
17. Pelucchi C, Bosetti C, Negri E, Malvezzi M, La Vecchia C. Mechanisms of disease: The epidemiology of bladder cancer. Nat Clin Pract Urol 2006;3:327-40.
18. Aghaji AE, Odoemene CA. Renal cell carcinoma in Enugu, Nigeria. West Afr J Med 2000;19:254-8.
19. Badmus TA, Salako AA, Arogundade FA, Sanusi AA, Adesunkanmi AR, Oyebamiji EO, *et al*. Malignant renal tumors in adults: A ten-year review in a Nigerian hospital. Saudi J Kidney Dis Transpl 2008;19:120-6.
20. Takure AO, Shittu OB, Adebayo SA, Okolo CA, Sotunmbi PT. Renal cell carcinoma in Ibadan: A 5-year clinicopathologic review. Afr J Med Med Sci 2013;42:239-43.