Annals of African Medicine
Vol. 5, No. 2; 2006: 64 – 67

A Ten-Year Pathological Study of Renal Tumours in Port Harcourt, Nigeria

[1]D. Seleye-Fubara, [2]E. N. Etebu and [2]N. J. Jebbin

Departments of [1]Anatomical Pathology and [2]Surgery, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

Reprint requests to: Dr. D. Seleye-Fubara, Department of Anatomical Pathology, University of Port Harcourt Teaching Hospital, P. M. B. 6173, Port Harcourt, Nigeria. E-mail: dsfubara@yahoo.com

Abstract

Background/Objective: To determine the relative frequency of renal tumours with respect to age, sex and clinical presentation.

Method: A retrospective review of histologic reports and clinical notes. Nephrectomy and renal specimens from autopsy were routinely processed and stained with hematoxylin and Eosin (H & E) stain. The completed slides were viewed under the light microscope for the diagnosis of the tumours.

Results: Thirty nine specimens accounting for 0.5% of the total tumours satisfied the criteria for the study. Thirty seven tumours (94.9%) were malignant while 2(5.1%) were benign. The youngest was an 8 months old female while the oldest was a 65 year old female. A total of 24(61.5%) tumours occurred in males while 15(38.5%) in females giving a sex ratio of 1.6:1. Nephroblastoma (64.1%) was the commonest malignancy and majority occurred in children while renal cell carcinoma was the most common adult renal tumour. Haematuria was the most frequent clinical presentation. .

Conclusion: Renal tumours are rare in this environment but they may pose a significant morbidity and mortality. Though some present with severe clinical symptoms others may go unnoticed.

Key words: Renal tumours, nephroblastoma, renal cell carcinoma, haematuria

Résumé

Introduction/Objectif : Déterminer la fréquence relative à la tumeur rénale par rapport à l'âge, sexe, et présentation clinique.

Méthode : Un bilan rétrospectif des rapports histologiques et des notes cliniques. La néphrectomie et des spécimens/échantillons rénals d'autopsie ont été systématiquement analysés et tachés avec hématoxyline et Eosine (H & E) tache. Des préparations complètes ont été examinées à la loupe avec la lumière pour le diagnostic des tumeurs.

Résultats : Trente neuf échantillons contituent 0,5% de toutes les tumeurs ont satisfié le critère pour l'étude. Trente sept tumeurs soit 94,9% étaient de la nature maligne tandis que 2 tumeurs soit 5,1% étaient bénigne. La plus jeune était une sujet du sexe féminin âgée du 8 mois tandis que la plus vieille était une femme âgée de 65 ans. Un total de 24 soit 61,5% des tumeurs se sont produit chez des sujet du sexe masculin tandis que 15 soit 38,5% ont eu lieu chez du sexe féminin ce qui donne une proportion de 1,6 :1. Néphroblastome 64,1% était la malignité la plus fréquente et la majorité est arrivée chez des enfants tandis que carcinome cellule rénale était la tumeur rénale des adultes la plus fréquente. L'hématurie était une présentation clinique la plus fréquente.

Conclusion : Des tumeurs rénales sont rare dans cette région mais pourraient provoguer une morbidité et une mortalité importante. Quoique quelqu'unes présentent des symptômes cliniques graves des autres pourraient passer inaperçu.

Mot clés : Tumeurs rénales, néphroblastome, carcinome cellule rénale, hématurie

Introduction

The normal human nephrogenesis is known to be initiated by the ingrowth of the urethral bud into the metanephric mesenchyme, which then condenses and form the different portions of the nephron.[1] Renal tumours result from genetic changes that disrupt the balance regulating normal cellular growth and

development. The genetic changes do no only include the classic point mutations but also deletion of entire gene as well as gross chromosomal abnormalities at specific sites in the genome.[2]

Renal tumours can be classified based on biological behaviour as well as histogenesis and differentiation.[2, 3] Nephroblastoma is the most common childhood renal malignancy and the second most common childhood malignancy after Burkitt's lymphoma.[4-6] The most common adult renal tumour is renal cell carcinoma.[3, 7, 8] Angiomyolipoma, once thought to be a harmatoma, is now regarded as a benign tumour of renal origin.[9, 10]

This is a report of the experience with renal tumours at the University of Port Harcourt Teaching Hospital (UPTH), Nigeria.

Materials and Method

A retrospective study of 39 renal tumours was carried from January 1990 - December 2001 at University of Port Harcourt Teaching Hospital the only referral hospital in Port Harcourt, Nigeria.

These tissues were made up of 28(71.8%) surgical and 11(28.2%) autopsy specimens. The tissues were initially fixed in 10% formalsaline, processed and embedded in paraffin wax. They were sectioned, mounted on glass slide and stained with haematoxylin and eosin (H & E) stains. In cases of broken slides and those in which both slides and blocks could not be located, and those with inadequate documentations were excluded from the study. The completed slides were viewed under the light microscope for the diagnosis.

Results

A total of 7,782 tumours were histologically diagnosed in UPTH during the twelve years under review (January 1st 1990 – December 31st 2001). Out of these, 39 where renal tumours made up of 28 surgical and 11 autopsy specimens; which accounted for 0.5% of the total tumours. Thirty seven (94.9%) were malignant and 2(5.1%) were benign. The youngest was 8 months old while the eldest was 65 years old.

Table 1 shows the clinical presentation of renal tumours in the patientts. The most common features were hematuria (23.1%), loin pain (15.3%) and abdominal mass (12.8%).

Table 2 shows the age and sex distribution. These tumours were commoner in the age group 0-5 years (43.6%). A total of 24 (60.5%) tumours occurred in males while 15(38.5%) occurred in females giving a ratio of 1.6:1 male dominance.

Table 3 shows the histologic types of renal tumours. The most frequent was nephroblastoma 25(64.1%) m = 14, f = 11 and both mesoblastic, nephroma and angiomyolipoma were the least frequent (2.6% each). These were punctuated by renal cell carcinoma 10(25.6%) m = 8, f = 2 and lymphoma (5.1%) m = 1, f = 1.

Table 1: Clinical presentation of renal tumours in UPTH, Port Harcourt

Clinical presentation	No. (%)
Haematuria	9 (23.1)
Loin Pain	6 (15.3)
Abdominal Mass	5 (12.8)
Hypertension	4 (10.3)
Anemia	4 (10.3)
Weight loss	2 (5.1)
Recurrent fever	1 (2.6)
Haematuria/anemia	4 (10.3)
Haematuria/abdominal mass	2 (5.1)
Haematuria/hypertension	1 (2.6)
Haematuria/loin pain	1 (2.6)
Total	39 (100)

Table 2: Age and sex of patients with renal tumours in UPTH, Port Harcourt

Age (years)	M		F		Total (%)
	Benign	Malignant	Benign	Malignant	
0 – 5	-	10	1	6	17 (43.6)
6 – 10	-	1	-	1	2 (5.1)
11 – 15	-	3	-	-	4 (10.3)
16 – 20	-	1	-	-	1 (2.6)
21 – 25	-	2	-	-	2 (5.1)
26 – 30	-	-	-	-	0 (0)
31 – 35	-	1	-	-	1 (2.6)
36 – 40	1	-	-	1	2 (5.1)
41 – 45	-	-	-	1	1 (2.6)
46 – 50	-	1	-	-	1 (2.6)
51 – 55	-	2	-	1	3 (7.7)
56 – 60	-	2	-	2	4 (10.3)
61 and above	-	-	-	1	1 (2.6)
Total (%)	1(2.6)	23(59)	1(2.6)	14(35.9)	39 (100)

Table 3: Sex and histologic type of renal tumours UPTH, Port Harcourt

Histologic type	Sex		Total (%)
	M	F	
Nephroblastoma	14	11	25 (64.1)
Renal cell carcinoma	8	2	10 (25.6)
Lymphoma	1	1	2 (5.1)
Mesoblastic nephroma	-	1	1 (2.6)
Angiomyolipoma	1	-	1 (2.6)
Total (%)	24(61.5)	15(38.5)	39 (100)

Discussion

Primary renal tumours are rare World wide. It accounted for 2% in Jos, Nigeria[4] and 1-2% of all malignant tumours in America.[11] This value is higher than the 0.5% recorded in this study. The disparity may be attributed to sample size. Out of the few renal tumours in this study, 94.9% were malignant tumours. Secondary tumours of the kidney in which the primaries were located in the lungs, breast and uterus[11] were not noticed in this study.

Some renal tumours may be clinically insignificant, [12] while others present as painless haematuria, palpable abdominal mass, loin pains, unexplained anemia, weight loss, pyrexia and multiple symptoms in a manner similar to our study. In other cases, the patients presented with hydronephrosis, varicocele, pathological fracture of bones as a result of bone metastases but all these were not found in this study. The paraneoplastic syndromes associated with renal tumours such as hypertension, hypercalcaemia, [11] erythrocytosis, hepatic dysfunction (Stauffer's syndrome) and amyloidosis[13] were not seen either except hypertension which was a clinical presentation in 15.3% of our patients.

There are age defining renal tumours; for instance nephroblastoma, Burkitt's lymphoma and mesoblastic nephroma are mainly childhood renal tumours while renal cell carcinoma, non-Hodgkin's lymphoma and angiomyolipomas are adult renal tumours though a few of these can occur in either extremes of age in a very low proportion.[3-5,7,8] Renal tumours currently rank among the most common malignancies in infants and children where it accounted for 25% of all neoplastic diseases.[8,14] About 59% of our cases occurred in patients of 15 years and below, of which the overwhelming majority were malignant tumours. The male dominance in frequency of renal tumours was also noticed in other studies[15] but the reason for the disparity is unclear.

The most common childhood renal tumour in this report was nephroblastoma meaning that, renal cell carcinoma infrequently occur in infants and children.[8] In our experience, renal cell carcinoma was not found in childhood. Nephroblastoma arise from the metanephrogenic tissue; a mass usually detected by parents. Some cases occur in children with tetralogic syndrome such as aniridia or the Beckwith-Weidemann syndrome composed of macroglosia, somatic disproportion and umbilical defects.[16] The most common clinical symptom in our experience was haematuria, loin pain, abdominal mass and hypertension. Grossly, the tumour is bulky, spherical and greyish white mass with no hemorrhage, necrosis or cyst. Microscopy shows dimorphic distribution of sheets of undifferentiated immature blastemal cells and variously differentiated elements, tubules, abortive glomerili or even dysontogenetic tissues like skeletal muscles.[16] It has been reported that renal cell carcinoma can arise from nephroblastoma in rare occasions[17] but this was not recorded by our study. Nephroblastoma though a malignancy of childhood in majority of cases, can occur in all ages and those occurring in older children tends to be more advanced and less responsive to treatment.[18] Six cases (15.4%) of nephroblastoma occurs in adolescence and adults in this study which is in keeping with other studies elsewhere.[19, 20]

A small renal tumour was seen at autopsy in an 8 months old female. It was greyish and measured 2cm in diameter. Histology showed sheets and interlacing bundles of eosinophilic spindle shaped cells with uniform elongated nuclei and bipolar cytoplasm, pericellular fibrosis and few areas of hyalinization. A diagnosis of mesoblastic nephroma was made.[21, 22] This tumour was found to be a congenital tumour of infancy and unusual after one year of age[3] confirming the age of our patient in this report and the tumour is known to run a benign course.[22] The autopsy of a child that died of suspected disseminated tuberculosis showed bilateral coating of the kidneys by 'fish-flesh' tumour; diagnosed histologically as Burkitt's lymphoma. This is not surprising since Burkitt's lymphoma usually affects bilateral organs[23] and is known to be the most common childhood malignancy in the Nigerian[4] and other African studies.[6] These are the childhood renal tumors seen in this study.

The non-Hodgkin's lymphoma diagnosed in the renal biopsy of a 48 year male was associated with HIV seropositivity. Though similar to another study elsewhere, [24] require further investigation since no HIV was associated with that study. Renal cell carcinoma was the most common renal tumour of adults in this study and others.[7,8] There was norecord of childhood renal cell carcinoma in this study as was the case in other studies.[4,7,8] Our patients presented with haematuria and loin pains along with flank mass. It can arise anywhere in the renal cortex. The tumour histologically consists of sheets, cords or tubular array of cuboidal cells with prominent cell walls and

conspicuous vacuolated or foamy cytoplasm rich in glycogen and lipid.

A small tumour which was incidentally found in a nephrectomy specimen was well circumscribed but not encapsulated. The histology is composed of blood vessels, smooth muscles and fat cells in variable proportion. A diagnosis of angiomyolipoma was made. This presentation and histologic findings were similar to other works,[11,12] but varies in that, there is no associated tuberous sclerosis as has been highlighted.[9-12]Though the clinical presentation was insignificant,[13] the lipid content and the age of the patient at presentation can lead to mistaken diagnosis of liposarcoma as was the case in other studies[10].

Finally, this study confirmed the rarity of renal tumours in this environment when compared to the frequency in the Western World. Despite the few recorded cases, a good majority are malignant with significant clinical symptoms while the benign tumours could go unnoticed.

References

1. Droz D, Rousseau-Merck M, Jaubert F, Diebold N, Adafor E, Mouly H. Cell differentiation in Wilm's tumour (nephroblastoma): an immunohistochemical study. Hum Pathol 1990; 21: 536-544
2. Kovacs G. Molecular differential pathology of renal cell tumours. Hisotpathol 1993; 22:1-8
3. Fleming S. Mixed and embryonal renal tumour in adults. Current Diagn Pathol 1994; 1:32-40
4. Mandung BM. Histological pattern of renal tumours in Jos, Nigeria. Niger J Med 1999; 8:24-26
5. Olufemi-Williams A. Tumours of childhood in Ibadan Nigeria. Cancer 1979; 36:370-378
6. Shija JK. Pediatric malignant tumours seen in Dares-salam, Tanzania. East Afr J Med 1984; 61: 212-219
7. Dhener LP, Leestma JE, Price EB Jr. Renal cell carcinoma in children. a clinicopathologic study of 15 cases and review of literature. J Pediat 1970; 76:358-368
8. Palma LD, Kenny GM, Morphy GP. Childhood renal carcinoma. Cancer 1970; 26:1321-1324
9. Murphy WA, Beckwith JB, Farrow G M. Angiomyo-lipoma. In: Atlas of tumor pathology: tumours of the kidney, bladder and related urinary structures. Armed forces Institute of Pathology, Washington DC, 1993;161-174
10. Mai KT, Perkins DG, Collin JP. Epithelial cell variant of renal angiomyolipoma. Histopathol 1996; 28:277-280
11. Mann VC, Russel RCG, Williams NS. Bailing and Love's short practice of surgery. Chapman and Hall, London, 1997; 780-849
12. Eble JN. Angiomyolipoma of the kidney. Semin Diagn Pathol 1998; 15: 21-40
13. Morzer RJ, Bender NH, Nanus DM. Renal cell carcinoma. N Engl J Med 1996; 865 – 875
14. Stoswens D. Diseases is of the urinary system. In: Paediatric pathology. William and Wilkins, Baltimore, 1966; 657
15. Ritchie AWS. In: McArdle CS (ed). Kintney surgical oncology: current concepts and practice. Butterworth, London, 1990; 145-160
16. Schreiner GF, Kissane JM. The urinary system. In: Anderson's pathology. Mosby, St. Louis, 1990; 847 – 849
17. Allsbrook WC, Boswell WC, Takahashi H et al. Recurrent renal cell carcinoma arising in Wilm's tumour. Cancer 1991; 67: 690 – 695
18. Farrow GM. Disease of the kidney. In: Murphy WM (ed). Urological pathology. Saunders, Philadelphia, 1997; 482 – 483
19. Merten DF, Yang SS, Berstein J. Wilm's tumours in adolescence. Cancer 1976; 37: 1532 – 1538
20. Hentrich MU, Meister P, Brack NG, Lutzll, Hartenstein RC. Adult Wilm's tumour: reports of two cases and review of literature. Cancer 1995; 75: 545 – 551
21. Marsden HB, Newton WA. New look at mesoblastic nephroma. J Clin Pathol 1986; 39:508 – 513
22. Sandstedt B, Delemarre JFM, Krul E J, Tournade MF. Mesoblastic nephroma: a study of 29 tumours from the SIOP nephroblastoma file. Histopathol 1985; 9:741-750
23. Smith MJ, Caraway N, Truong LD. Renal Lymphoma: the morphologic spectrum and clinical correlates in 23 cases. A case report with Literature review. Mod Pathol 2003; 16:171a – 172a
24. Tsang K, Kneafsey P, Gill NK. Primary lymphoma of the kidney in the acquired immunodeficiency syndrome. Arch Pathol Lab Med 1993; 117: 541 – 543