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HISTOPATHOLOGICAL PATTERN OF RENAL TUMOURS SEEN IN USMANU DANFODIYO UNIVERSITY TEACHING HOSPITAL SOKOTO, NIGERIA

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ABSTRACT

Aim: Malignant renal tumour is a relatively rare type of cancer that occurs third in urological tumours after prostate and bladder cancers. Little is known in the literatures about its existence in Sokoto which prompted this research. This study was carried out to determine the prevalence and histopathological pattern of malignant renal tumours in Sokoto, Nigeria.
Methods: A total of 11,554 H&E stained sections were reviewed from 2001 to 2012. Patient's data such as age and sex were analyzed from 36 samples which were confirmed for renal tumours.
Result: Nephroblastoma has the highest occurrence in malignant cases (48.4%) followed by renal cell carcinoma (41.9%) and transitional cell carcinoma (9.68%). It was observed that nephroblastoma (15 cases) was most prevalent in the 0-7 year age group showing it is a childhood tumour, while the other ones occurred mostly in the adults.
Conclusion: Nephroblastoma has the highest occurrence in malignant renal cases in Sokoto, Nigeria.

Key words: Malignant renal tumour, Nephroblastoma, Renal cell carcinoma

INTRODUCTION

Malignant renal tumour is among the 10 most occurring cancers in western communities. Globally, about 270,000 cases of this tumour are diagnosed yearly and 116,000 people died from the disease (Borje *et al.*, 2011). In the United Kingdom, renal cancer is the eighth most common cancer in men (5,377 new cases diagnosed in 2008), and the ninth most common cancer in women (3,380 new cases in 2008), giving a male: female ratio of over 3:2 (Thyavihally *et al.*, 2005; Cancer Research, 2010). In 2008, in the United States, there were around 54,390 new cases of kidney cancer and 13,010 deaths from the disease

(Thyavihally *et al.*, 2005). Malignant renal tumour is more common in developed countries compared to African countries and this is well documented in literatures (Landis *et al.*, 1999; Sow *et al.*, 2006; Tijjani *et al.*, 2012). In Nigeria, Lawani *et al.*, (1982) reported that malignant renal tumour accounted for 20.9% of all urogenital tumours. In a similar research Klufio (2004) showed that malignant renal tumour accounted for 10.4% of all urogenital tumours in Ghana. Malignant renal tumour is more common in males, aged 16-80 years, with peak incidence in the fifth and sixth decades of life (45-60 years). Aghaji and Odoemene (2000) observed similar prevalent age-range in patients with renal cell carcinoma (RCC) in Eastern Nigeria. Thus, the peak incidence of malignant renal tumour in Nigeria occurs about a decade lower than the 50-70 years peak incidence reported in literature amongst the Caucasians. Renal cell carcinoma is a malignant neoplasm with numerous tumour subtypes, each distinct genetically and unique clinically. The traditional histological subtypes of RCC are: Clear cell, Granular cell, Sarcomatoid and Tubulopapillary tumours. Following proposal by Kovacs (1993) which was later reviewed by Weiss and colleagues (1995), new histological subtypes such as the chromophobe cell carcinoma have been added; granular cell tumours have been reclassified and the sarcomatoid lesions have now been recognized to represent poorly differentiated elements derived from other histological subtypes. Among young African Americans with sickle cell trait, a medullary cell variant of renal cell carcinoma is common (Davis *et al.*, 1995). Current development in gene expression profiling and proteomic analyses has helped in appropriately classifying these tumours into different subtypes (Amy-Bazille *et al*, 2004). Histologically, renal cell carcinoma occurs in 3 most common forms, namely clear cell carcinomas, papillary renal cell carcinomas and chromophobe renal cell carcinomas. Clear cell carcinomas appear with clear cytoplasm and enlarged nuclei while the papillary carcinomas have a papillary growth pattern. The chromophobe renal cell carcinomas stained more darkly than the clear cell carcinomas. Nephroblastomas or Wilm's tumour composed of small, primitive-appearing cells with dark nuclei, scanty cytoplasm, and poorly defined cell borders growing in solid sheets. Urothelial carcinomas otherwise called transitional cell carcinomas occur in the renal pelvis and are similar to transitional cell carcinomas of the bladder (Kumar *et al.*, 2004). This research was carried out at the Department of Histopathology, Usmanu Danfodiyo University Teaching Hospital Sokoto. The hospital serves as a reference centre to patients from Sokoto, Kebbi and Zamfara States of Nigeria.

MATERIALS AND METHODS

This is a retrospective study of renal samples received in the Department of Histopathology, Usmanu Danfodiyo University Teaching Hospital, Sokoto, Nigeria from January 2001 to December 2012. Demographic data such as age, sex and site of the biopsies were obtained from the patients' Histology request cards and Histology registers. Stained Haematoxylin and Eosin (H&E) slides were retrieved and reviewed, where slides could not be traced, their paraffinized blocks were traced, re-cut and re- stained using the same Haematoxylin and Eosin staining method and reviewed using light microscopy. The data obtained were analyzed with Statistical Package for Social Sciences (SPSS).

RESULTS

A total of 11,554 samples for histological confirmation were submitted to the Histopathology laboratory for evaluation from January 2001 to December, 2012. Out of these, 36 samples were confirmed as renal tumours, this constituted 0.31% of all the diagnosis made within the period under review. There were 5 cases of benign lesions (1 male and 4 female) while 31 cases were malignant lesions (19 males and 12 females).

Table 1: Age and sex distribution of malignant renal tumours

AGE (YR)	MALE	FEMALE	TOTAL
0-7	10	5	15
8-14	0	0	0
15-21	1	1	2
22-28	2	2	4
29-35	2	0	2
36-42	1	0	1
43-49	2	1	3
50-56	1	2	3
57-63	0	1	1
TOTAL	19	12	31

Table 2: Distribution of common renal malignant tumours

TYPE	NUMBER	%
Nephroblastoma	15	48.4%
RCC	13	41.9%
TCC	3	9.7%
TOTAL	31	100

Table 3: Age distribution of the common malignant tumours

AGE	RCC	NEPHROBLASTOMA	TCC
0-7	-	15	-
8-14	-	-	-
15-21	1	-	1
22-28	3	-	1
29-35	2	-	-
36-42	1	-	-
43-49	2	-	1
50-56	3	-	-
57-63	1	-	-
TOTAL	13	15	3

Table 4: Sex distributions of different types of renal malignancy

MALIGNANCY	MALE	FEMALE	TOTAL
Nephroblastoma	10	5	15
Renal cell carcinoma	6	7	13
Transitional cell ca.	3	0	3

Table 5: Common types of renal cell carcinoma

TYPE OF RCC	NUMBER OF CASES	%
Clear cell carcinoma	8	61.5%
Papillary RCC	5	38.5%

DISCUSSION

In general, renal tumours are not common in our society. It has an occurrence of 0.3% within the period under review (12years). This finding is similar to the studies by Seleye *et al* (2006) in Port Harcourt, which showed a renal tumour incidence of 0.5% of all tumours diagnosed during their study period. This was also reported by Lawani *et al.,* (1982) in eastern Nigeria, Agbaji and Odoemene (2000) in Enugu and Badmus *et al.,* (2008) in Ile-Ife which indicated low occurrence of the disease in Nigeria. The youngest age of renal tumour case found in this study occurred in a 1 year old patient while the oldest-age was a 60 year old patient. The mean age in this study was 31.5 years. Malignant renal tumour is more common in developed countries than in African countries and this is well documented in literatures (Landis *et al*., 1999; Sow *et al.,* 2006; Tijjani *et al.,* 2012). There are high cases of malignant renal tumours (86.1%) as compared to benign renal tumours (13.9%); this is due to very late presentation of the lesions to the hospital till they reached advanced stages. Mbaeri *et al.,* (2012) also reported the same late presentation of the lesions (78.9%) in Nnewi and patients hesitate in accepting available treatment option which is surgery. In most developed countries, more than 50% of these tumours are incidentally detected during routine screening when the tumours can effectively be cured (Pantuck *et al.,* 2000). Malignant renal tumour is more common in males 19 cases (61.3%) as compared to female's 12 cases (38.7%) with a male to female ratio of nearly 2:1. The male dominance in frequency of renal tumours was also noticed in other studies but the reason for the disparity is unclear. Seleye *et al.,* (2006) and Badmus *et al.,* (2008) also found higher proportions of the malignant cases in males in their studies in Port Harcourt and Ile-Ife. The highest age range with the tumour is 0-7years (15 cases) which are nephroblastomas also called

Will's tumour while the other types of malignant renal tumour occur in adult with renal cell carcinoma having the highest occurrence of 13 cases followed by transitional renal cell carcinoma with 3 cases. It was observed in this study that there is an early occurrence of malignant renal tumours in adults between the ages of 15-21years and then spread along the older ages. Therefore, the wide spread of this among the age ranges is an indication that this tumour can occur in any stage of human life as also seen in Ile-Ife (Badmus *et al.,* 2008). Nephroblastoma (Will's tumour) was the predominant malignancy found in this study accounting (48.4%) for all the malignancies, followed by renal cell carcinoma (41.9%) and transitional cell carcinoma (9.7%), as noted in Table 2. According to Cancer research (2010) in UK, around 85 cases of kidney cancer are diagnosed each year in children (0-14 year olds), with around three-quarters of these occurring in children under the age of five. The most common kidney cancer in childhood is Wilms' tumour or Nephroblastoma (Cancer Research, 2010; Stiller, 2007; Harsh, 2010). This has agreed with our study in which all the 15 cases of nephroblastoma occurred in the age range of 0-7years. Although Wilms tumor also occurs in adults, it is the third most common organ cancer in children younger than the age of 10 years mostly between the ages of 2-5 (Kumar *et al.,* 2004; Edward, 2007). Renal cell carcinoma (RCC) is the second most common malignant renal tumour with 13 cases (41.9%) and most occurring type in adults. RCC has been in records as the major type of malignant renal tumour in adults (Badmus *et al.,* 2008; Mbaeri *et al.*, 2012; Kumar *et al.*, 2004; Edward, 2007). These tumors are derived from the renal tubular epithelium, and hence they are located predominantly in the cortex. The risk of developing these tumors is higher in smokers, hypertensives and obese individuals, and those who have had occupational exposure to cadmium. Smokers who are exposed to cadmium have a particularly high incidence of renal cell carcinomas (Edward, 2007). There is no wide range of variation in occurrence of RCC between males and females as against what was reported in Lagos M:F (1:2) with females, twice predominance over males (Tijjani *et al.*, 2012). Clear cell carcinoma is the most common type of RCC with 8 cases (61.5%) while papillary RCC has 5 cases (38.5%). There is no occurrence of chromophobe type in our records. Chromophobe RCC is considered less aggressive than other forms of RCC namely clear cell carcinoma and papillary RCC (bhdsyndrome.org, 2013). Transitional cell carcinoma is the least in occurrence with only 3 cases (9.7%). It is the most common type of cancer affecting renal pelvis compared to squamous cell carcinoma. It is seen mostly in adults and all the 3 cases recorded occurred in male patients, the female patients did not have it. We conclude that the frequency of renal tumour in Sokoto, Nigeria is 0.3%. The most common MRT is nephroblastoma 48.4% occurring during childhood, followed by renal cell carcinoma 41.9% and transitional cell carcinoma 9.7% occurring in adults.

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