

Pattern of Adult Renal Cell Carcinoma in Kano, Nigeria: A 16-year Retrospective Review

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Abstract

Background and Objective: Renal cell carcinomas (RCCs) are the most common histological types of adults' renal cancer worldwide. Reviews on RCC distribution displayed predominant prevalence in the industrialized nations attributable to variations in vulnerability to environmental risks and genetic makeup. Nonetheless, the statistical conclusions of RCC in most sections of the Nigerian populace remain inadequate. This study aimed to evaluate the epidemiological pattern of the histologically confirmed renal cell carcinoma cases in Aminu Kano Teaching Hospital (AKTH), Kano - Nigeria. **Materials and Methods:** This was a 16-year retrospective review of the histologically confirmed RCC in AKTH, Kano, from January 2, 2001, to December 31, 2016. The data available during the period were collated and analyzed. **Results:** Twenty-four cases of RCCs were histologically confirmed during the study. The patient's ages ranged from 18 to 80 years, with a peak age in the sixth decade (50–59 years), and the male-to-female ratio of 2:1. Clear-cell variant was the predominant histological type. The tumors were all of the high-grade types, with 79% of patients having advanced disease. **Conclusion:** RCC is relatively rare in Kano. The precedence of high-grade and advanced-staged tumors in our review necessitates a search for better strategies that will enable early detection and prompt therapy.

Keywords: Clear cell variant, renal cell carcinoma, Kano, Nigeria

INTRODUCTION

Renal cell carcinomas (RCCs) are the most common histological type of adults' renal cancer worldwide.^[1] Their tendency for paraneoplastic syndromes^[2] and resistance to chemotherapy and radiotherapy make them stand out among lethal urological tumors. RCC has a genetic and environmental risks linked to its etiopathogenesis.^[3] The most important factor that improves the prognosis in the disease is nephrectomy when carried out in the early stage of the tumor following its detection.

Supplementary to its several urologic characteristics, RCC represents an average of 90% or even higher of all renal malignancies in adult's males and females depending on the populace.^[4] Its distribution, however, shows predominant prevalence in the industrialized nations.^[5] Atanda and Haruna systematically studied surveys on RCC from some sections of Nigeria and arrived at a national incidence in the vicinity of 0.3/100,000 population.^[6]

Nevertheless, complete conclusions cannot be reached on the prevalence of RCC in the general Nigerian population

due to inadequate data. This study aimed to evaluate the epidemiological pattern of the confirmed cases of adults with renal cancer in Kano, Nigeria.

MATERIALS AND METHODS

This was a 16-year retrospective review of the adult patients with histologically diagnosed RCC from January 2, 2001, to December 31, 2016, in the Pathology Department of Aminu Kano Teaching Hospital (AKTH) Kano, Northwestern Nigeria. The histopathological records were reviewed, and the histology slides were retrieved and studied by the authors. The variables recorded were the patient's age, patient's sex, and the histopathological variant of the RCC. Only patients who were 18 years and above were included in the study.

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In cases where the slides were not accessible, fresh sections were prepared from archival paraffin tissue blocks that were previously fixed in 10% formal saline and embedded in paraffin wax. The microtome sectioning was at 4 μ m thickness. The processed slides were stained with hematoxylin and eosin. No Immunohistochemistry staining was deployed for any of the slides.

The histological diagnoses were in accordance with the 2004 WHO classification of RCC.^[7] The data were analyzed using SPSS version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp). Statistical analyses of the data include mean, range, and ratio and presented as frequency tables with percentages where applicable. Ethical clearance was obtained from the hospital ethics and scientific committee.

RESULTS

Of the 9182 patients with histologically diagnosed malignancies during the study period, 24 (0.26%) were adults RCC. The age range was 18–80 years (mean age 46.6 years). The peak age group was in the sixth decade (51–60 years) while male-to-female ratio was 2:1. All were either Grade 3 or 4, with 19 cases (79%) showing no tumor-free margin at histology. Clear-cell variants [Figure 1] accounted for 9 cases (37.5% of adult RCCs); while papillary renal cell carcinoma [Figure 2] plus unclassified histological variants each 7 (29.2%) cases and a single case of chromophobe [Figure 3] was seen in the study. More histological details, age, and sex distribution of adult renal cell cancers in Kano are shown in Table 1.

DISCUSSION

This study was carried out at AKTH in Kano state, the most populous state in Nigeria with a population of over 10 million people.^[8] The 0.26% of all cancer cases seen in 16 years indicated a low prevalence of RCCs among adults in the state. The count concurred with the conclusion on the pattern of urological cancers in Kano by Abdulkadir *et al.*^[9] The percentage was lower than a preceding 10-year analysis a decade earlier of the Kano cancer registry which, however, was a documentation of all renal cancer including childhood renal tumors.^[10] Studies from other parts of Northern Nigeria showed 22 cases of RCC from Jos over a 7-year period and 13 cases seen in Sokoto in 12 years.^[11,12] From the southern parts of the country, 10 cases were observed in 10-years in Port Harcourt and 64 cases were in Lagos over 10 years.^[13,14] The national incidence of RCC was put at 0.3/100,000 by Atanda and Haruna in a systematic study of surveys from some parts of the country.^[6] Our study reveals a rate less than this national incidence and the global age-standardized incidence rate of 4/100,000/year.^[15] The prevalence in our study was less than that from North and South Africa where an incidence of 3.3/100,000 and 2.6/100,000 populations were reported, respectively. This was also less than reported 6.1/100,000 in Brazil and substantially less than 22.5/100,000 in parts

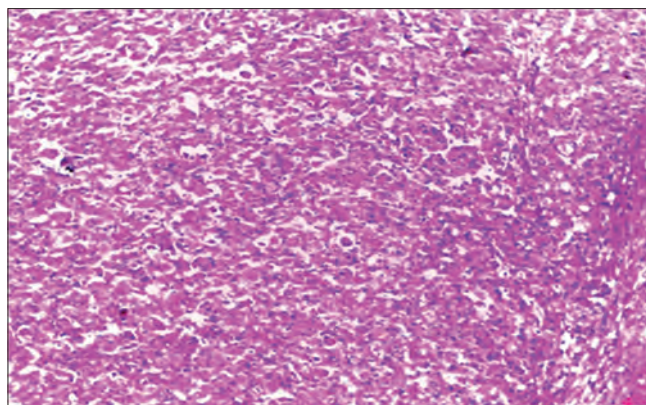


Figure 1: Clear-cell renal cell carcinoma H and E, $\times 40$

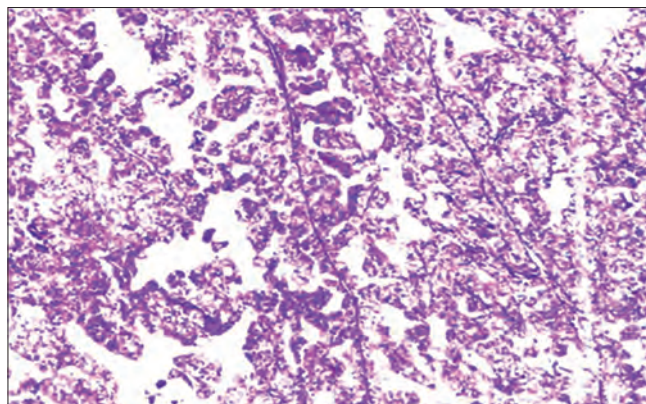


Figure 2: Papillary renal cell carcinoma H and E, $\times 40$

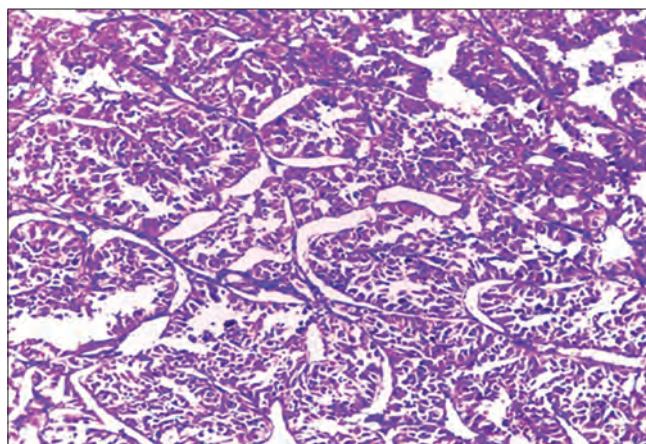


Figure 3: Chromophobe renal cell carcinoma H and E, $\times 40$

of Europe and the United States of America.^[15] Karim-Kos *et al.* suggested the differential distributions of RCC is not only due to variations in vulnerability to environmental and genetic risks but also due to the rate of imaging studies which could correlate with how well medically served communities are.^[16] Furthermore, the lower relative rates of RCC in sections of Nigeria could also be ascribed to the reviews limited to hospital-based statistics, as opposed to those from community-based cancer registries from the western world.^[17]

Table 1: Histological types, age, and sex distribution of adult renal cell carcinomas in Kano

Histological type	18/19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80-89 years	Sex		Frequency, n (%)
									Male	Female	
Clear cell	-	-	-	3	4	1	1	-	6	3	9 (37.5)
Papillary	-	1	-	2	1	1	1	1	4	3	7 (29.2)
Chromophobe	-	-	-	1	-	-	-	-	1	-	1 (4.1)
Unclassified	2	1	-	-	3	-	1	-	5	2	7 (29.2)
Total	2	2	-	6	8	2	3	1	16	8	24 (100)

The mean age of 46.6 years in this study is similar to reviews from Jos, Enugu, Lagos, Ghana, and Cameroon.^[11,14,18-20] This was, however, below the common 7th decade in the western literature.^[17] Hence, RCC appears to occur at a relatively younger age in the developing world. Shorter life expectancy and genetic variations might be the basis for the disparities.^[21]

The higher prevalence among males in this study concurred with the literature worldwide.^[22-24] However, two Nigerian studies documented a modest female dominance in the ratio of 1:1.2 in Jos and 1:1.7 in Lagos.^[11,14] For the most part, males are more vulnerable to the environmental recognized risk factors that included cigarette smoking and exposure to chemical carcinogen.^[25]

Clear-cell RCC was clearly the most common histological variants; this concurs with histological distribution worldwide.^[14,23,26] The relatively higher proportions of unclassified categories may be due to nonincorporation of Immunohistochemistry in our appraisal as is obtained in most resources limited centers.

In excess of three quarter (79%) of the cases showed no tumor-free margin at histology (the tumors were either stage 3 or 4). Added to this, all are grade 3 or 4; these traits are associated with poor prognosis. A delay in the patient's presentation is typical in this part of the world.^[22] This differs from developed world where the bulk of the patients present at an early stage.^[24] The differences correlated to the rate of abdominal ultrasound and computed tomography scan studies that may equate with the rates of incidental discovery of RCC. Consequently, this could translate into an earlier diagnosis in better medically served communities.^[14] The crest and trough pattern on the graph of the prevalence through the appraisal period in Figure 4 disavows reports suggesting increasing incidence of RCC over time.^[24,27]

Our study was not free from the limitations of retrospective institutional-based studies. This prevalence is likely a tip of the iceberg of the true prevalence because not all patients avail themselves to orthodox medical care in our environment. In addition, the inoperable patients are unaccounted for and further worsened by a strong societal disapproval of autopsy. This results in underestimations in records on cancer-specific mortalities in our locality. Likewise, not all the tissues get to our institution by virtue

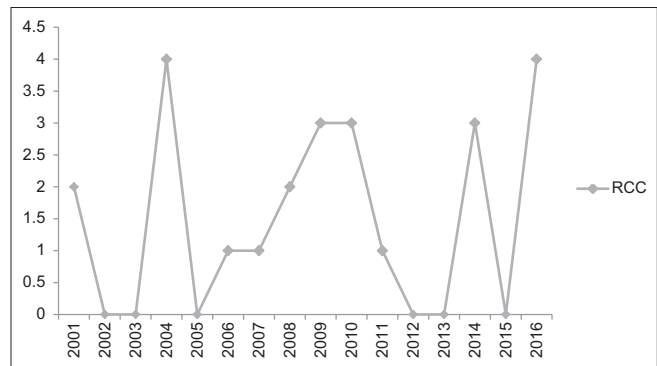


Figure 4: Graph of prevalence of adult renal cell carcinoma in Kano from 2001 to 2016

of the vastness of the study domain and attached cost that histology incurred.

CONCLUSION

The only 24 cases histologically diagnosed in 16 years implied relatively low prevalence of RCC in our environment. The epidemiological variables remain similar to what obtains elsewhere in the developing societies. Clear-cell variant was the most common histological variant. The precedence of high-grade and advanced tumors signals the needs for a search of better strategies that will enable early presentation and detection for prompt therapy expected to translate into a better outcome.

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Conflicts of interest

There are no conflicts of interest.

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