

MORPHOLOGICAL CHARACTERIZATION OF RENAL TUMOURS ACCORDING TO DECADES OF LIFE: EXPERIENCE AT AFIP RAWALPINDI, PAKISTAN

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ABSTRACT

Objective: To evaluate morphological characterization of renal tumours according to decades of life and to compare it with other national and international studies.

Study Design: Descriptive study

Place and duration of study: The retrospective study was carried out in the Department of Histopathology, Armed Forces Institute of Pathology (AFIP) Rawalpindi during the years 2005 to 2008.

Patients and Methods: Data of 236 nephrectomy specimens diagnosed as renal tumours during the years 2005 to 2008 was retrieved from tumour registry of AFIP, Rawalpindi. The morphological characterization of these tumours according to decades of life was done and compared with the international data.

Results: Of 236 cases of renal tumours, 169 (72%) were males and 67 (28%) were females. The mean age of the patients was 50 years (SD=18.5) ranging from 1 to 80 years. The most common histological diagnosis in adults was conventional renal cell carcinoma in 172 (73%) patients followed by papillary renal cell carcinoma in 20 (8.5%) patients. Among children Wilm's tumour was the most common in 21 (9%) of patients. Conventional renal cell carcinoma was most commonly diagnosed in the patients aged between 51 to 60 years (52 cases) where as 17 out of 21 cases of Wilm's tumour were diagnosed in the age group of 1 to 10 years.

Conclusion: Renal cell tumours are diagnosed in all ages. Conventional renal cell carcinoma and papillary renal cell carcinoma are the most common types in non pediatric age group whereas Wilm's tumor is most common type in pediatric age group. The chromophobe renal cell carcinoma was very rare in our study. Males had a greater incidence as compared to females and incidence of renal tumours has the trend of increase over the years.

Key words: Renal tumours, morphology, characterization, decades of life

INTRODUCTION

The renal tumours have a diverse morphological spectrum ranging from renal cell carcinoma in adults to Wilm's tumour in children. Renal tumours account for 3% of all new cases of cancer diagnosed in men and just under 2% of all cancer in women in the UK¹. Even though renal tumours are relatively rare, there have been reports of increasing incidence and mortality across the world. This increase in incidence has been attributed to some extent to the advancements in diagnostic imaging techniques resulting in detection of more renal tumours.

Clear cell (Conventional) renal cell carcinoma is the most common renal tumours

in adults and Wilm's tumour is most common in children. The average age at diagnosis of renal cell carcinoma is 55 to 60 years. The average age at diagnosis of Wilm's tumour is 3 years². In an analysis of ten years data (1992 - 2001) from tumour registry of Armed forces Institute of Pathology Rawalpindi, Renal cell carcinoma was the most common type followed by transitional cell carcinoma with majority of cases in 50-70 years age group in both genders³. The renal tumours especially renal cell carcinomas that are diagnosed at relatively younger age usually present at an early stage i.e. T1a. The age of the patient at the time of diagnosis of renal tumours therefore can be used as a prognostic marker; the younger age associated with good prognosis⁴.

In this study we evaluated the morphological spectrum of renal tumours

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diagnosed at Armed Forces Institute of Pathology (AFIP), Rawalpindi during the years 2005-2008 and categorized them into different age groups to assess the average age at diagnosis of different renal tumours in our setup.

MATERIAL AND METHODS

Data of 236 nephrectomy specimens diagnosed as renal tumours during the years 2005 to 2008 was retrieved from tumour registry of AFIP, Rawalpindi and was evaluated.

The data was entered in SPSS version 11 and the cases were evaluated for age of the patient, gender, age groups and year of diagnosis. The final histological diagnosis was noted and their frequencies and percentages were calculated individually and according to the gender, age groups and year of diagnosis. These tumours were evaluated gender wise and according to different age groups and year of diagnosis. The frequency of each renal tumour was evaluated and mean age of each group was calculated.

RESULTS

236 cases of renal tumours were evaluated during the year 2005 to 2008. 169 (72 %) were males and 67 (28%) were females. The mean age of the patients was 50 years (SD=18.5) ranging from 01 to 80 years.

The most common histological diagnosis

was conventional (clear cell) renal cell carcinoma in 172 (73%) patients followed by Wilm's tumour in 21 (9%) patients which was also the most common renal tumour in children. The frequencies of various tumours diagnosed on light microscopy are summarized in Table 1.

Among 169 male patients, the most common diagnosis in adults was conventional (clear cell) renal cell carcinoma in 124 (73%) patients followed by papillary renal cell carcinoma in 16 patients. In children, Wilm's tumour was diagnosed in 15 (9%) patients in males. In 67 female patients, conventional renal cell carcinoma was diagnosed in 48 (72%) adult patients and Wilm's tumour in 6 (9%) patients of child age group. The frequencies of histological diagnosis in males and females are summarized in Table-1

In different age groups of the patients, conventional renal cell carcinoma was most commonly diagnosed in the patients aged between 51 to 60 years. Of 172 cases of conventional renal cell carcinoma, 52 (30%) cases were diagnosed in this age group followed by 42 cases (25%) in the age group of 41 to 50 years. The mean age of the patients of conventional renal cell carcinoma was 55 years (SD=12.33). In paediatric renal tumours of 21 cases of Wilm's tumour, 17 (81%) were diagnosed in the age group of 1 to 10 years, 2 (9.5%) in age groups of 11 to 20 and 2 (9.5%) in

Table-1: Gender wise distribution of renal tumours (n=236)

Histological diagnosis	Gender of the patient		Total
	Male	Female	
Conventional RCC	124	48	172
Wilm's tumour	15	6	21
Papillary RCC	16	4	20
Transitional cell carcinoma	6	2	8
RCC unclassified	3	4	7
Squamous cell carcinoma	2	-	2
Lymphoma	-	1	1
Chromophobe RCC	-	1	1
Rhabdomyosarcoma	1	-	1
PNET/Ewing's sarcoma	-	1	1
Collecting duct carcinoma	1	-	1
Rhabdoid tumour	1	-	1
Total	169	67	236

age group of 21 to 30 years. The mean age of the patients of Wilm’s tumour was 7 years. The distribution of different renal tumours in different age groups is summarized in Table 2. Mean age of the patients in different renal tumours is summarized in Table 3.

DISCUSSION

Renal cell tumours accounts for approximately 3% of adult malignancies, and its incidence increases with age, with a peak in the sixth decade of life and a median age of 55

years⁵. Although most renal cell tumours are sporadic and relatively uncommon in young adults, their incidence in this age group has steadily increased during the past several decades⁶. In this study we have tried to compare the overall frequencies of renal cell tumours as well as their distribution in different age groups with other studies.

In most of the studies, it was found that males were more frequently affected than females⁷⁻⁹. These results were comparable with

Table-2: Age wise distribution of renal tumours (n=236).

Histological diagnosis	Age group of the patient								Total
	1-10 years	11-20 years	21-30 years	31-40 years	41-50 years	51-60 years	61-70 years	71-80 years	
Conventional RCC			6	19	42	52	38	15	172
Wilm’s tumour	17	2	2						21
Papillary RCC		1	1	2	6	3	6	1	20
Transitional cell carcinoma		1		1	2	2	2		8
RCC unclassified				2	1	3	1		7
Squamous cell carcinoma							2		2
Lymphoma				1					1
Chromophobe RCC				1					1
Rhabdomyosarcoma			1						1
PNET/ Ewing’s sarcoma			1						1
Collecting duct carcinoma				1					1
Rhabdoid tumour				1					1
Total	17	4	11	28	51	60	49	16	236

Table-3: Mean age of patients in different renal tumours (n=236).

Histological diagnosis	Mean age of patients	Number of tumours	Standard deviation
Conventional RCC	54.98	172	12.33
Wilm’s tumour	6.67	21	7.123
Papillary RCC	52.10	20	15.33
Transitional cell carcinoma	50.63	8	17.36
RCC unclassified	52.29	7	12.31
Squamous cell carcinoma	64.50	2	2.12
Lymphoma	35	1	-
Chromophobe RCC	33	1	-
Rhabdomyosarcoma	27	1	-
PNET/Ewing’s sarcoma	25	1	-
Collecting duct carcinoma	33	1	-
Rhabdoid tumour	36	1	-
Total	50	236	18.57

our results in which 76% patients were male and 24% were females in patients more than 40 years of age. This difference was less in patients <40 years of age (58% males as compared to 42% females). Similarly in other studies in which gender distribution was studied in patients less than 40 years of age, same results were found as in the present study^{9,10}. So nearly all studies conclude that males are more disposed to renal cell tumours as compared to females.

The mean age of patients for tumours above 40 years of age was reported to be 50-60 years whereas it is 34-38 years for patients below 40 years of age having tumour^{1,8-12}. Same results were found in the present study.

The most common tumour in our study was Clear cell conventional renal cell carcinoma. In a study by Zhang J et al¹ most common type was Clear cell Renal cell carcinoma followed by papillary renal cell carcinoma and chromophobe renal cell carcinoma. Similarly Thompson RH et al⁸, Suh JH et al⁹ and Thomas EH¹³ reported these tumours in order of frequency. In present study the tumour types in patients above 40 as well as below 40 years of age were Clear cell conventional renal cell carcinoma followed by papillary renal cell carcinoma and Renal cell carcinoma, Unclassified were found in descending order of frequency. We found other studies in which frequencies were calculated in patients less than 40 years of age excluding pediatric age group e.g. in study by Thompson RH et al⁵ clear cell carcinoma (69%) was most common, followed by chromophobe renal cell carcinoma (17%). Goetz et al⁸, Coa Y et al³ and Eggen⁹ studies revealed that most common type was clear cell renal cell carcinoma followed by chromophobe renal cell carcinoma. The important observation in our study was that although clear cell carcinoma and papillary renal cell carcinoma were also commonest tumours in our study but chromophobe renal carcinoma was very rare. Likewise the percentage of RCC, unclassified was comparatively greater in our study as compared to other studies.

Twenty patients in our study were from pediatric age group. Majority of them were diagnosed as Wilm's tumor and one as papillary renal cell carcinoma. Surprisingly two patients in our study were diagnosed as Wilm's tumor in third decade. During the study period of 2005 to 2008 there were virtually no other pediatric age group renal tumours like clear cell sarcoma, mesoblastic nephroma, multicystic nephroma etc. Predominantly Wilm's tumour was observed in most of the other studies^{2,14}. The highest incidence for Wilm's tumor was in the first 2 years of life, followed by steadily decreasing rates with increasing age. Out of 21 Wilm's tumours diagnosed in our study, 13(62%) cases were below 5 years of age, 4(19%) cases in 6-10 years of age, 2(9.5%) cases in¹¹⁻¹⁵ years of age. Surprisingly two cases of Wilm's tumor were diagnosed in patients 25 years of age.

In present study it was observed that the frequency of renal cell tumours has slightly increased over the years. Falebita OA et found that age-adjusted incidence of renal cell carcinoma per 100,000 person-year as mentioned in available literature increased from 5.2 in 1994 to 6.8 in 2005, an annual percentage change of +3.4%¹⁵. Ritchie AWS et al on an analysis of standardized incidence rates for renal parenchymal tumours over a 14-year period in Scotland demonstrated a significant increase in disease incidence for males but not females¹⁶. In another study an increase in renal cell carcinoma incidence was found with localized cancer accounting for most of the increase. Black patients had a significantly higher incidence rate ($p < 0.0001$) and lower survival rate ($p < 0.0001$) than all other races/ethnicities despite having more localized cancer ($p < 0.005$)¹⁷.

CONCLUSION

Renal cell tumours are diagnosed in all ages. Conventional renal cell carcinoma and papillary renal cell carcinoma are the most common types in non pediatric age group whereas Wilm's tumor is most common type in pediatric age group. The chromophobe renal cell carcinoma was very rare in our study. Males had a greater incidence as compared to

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