



Urology

EPIDEMIOLOGICAL AND HISTOPATHOLOGICAL ANALYSIS OF RENAL CELL CARCINOMA-A SINGLE INSTITUTIONAL RETROSPECTIVE CROSS-SECTIONAL STUDY

Prof. Dr. V. Ezhil Sundar	Associate professor of Urology, Madras Medical College, RGGGH, Chennai.
Dr PR Saravanan	Assistant Professor Of Urology Madras Medical College, RGGGH, Chennai.
Dr J Sivabalan	Assistant Professor Of Urology, Madras Medical College, RGGGH, Chennai.
Dr Selvambigai	Associate Professor Of Pathology, Madras Medical College, RGGGH, Chennai.
Dr Veeraiah R*	Resident, Madras Medical College, RGGGH, Chennai. *Corresponding Author

ABSTRACT **Introduction:** The incidence of Renal Cell Carcinomas (RCCs) has been steadily increasing, making them the seventh most common histological type of cancer worldwide. **Aim:** This study aimed to assess the profile of RCC patients in terms of age distribution, sex distribution, clinical presentation, laterality of tumor, staging, and histopathological examination. **Materials And Methods:** A retrospective descriptive study was conducted at the Department of Urology, Rajiv Gandhi Government General Hospital in Chennai, India, from January 2020 to December 2023. The study recorded data related to demographic characteristics, type of RCC, site of the tumor, histopathology, tumor grade, and stage, lymphovascular invasion, perinephric fat invasion, pelvicalyceal system involvement, percentage of necrosis, renal vein involvement, an association of sarcomatous or rhabdoid features, and ISUP nuclear grading system. Statistical analysis will be performed using the SPSS program for Windows, version 21.0. **Results:** This study involved 73 patients diagnosed with renal cell carcinoma (RCC). Of these, 47 were male and 26 were female. Most patients were in the 50-60 age group (26.9%). Left kidney involvement was observed in 38 patients (51.1%), while right kidney involvement was observed in 35 patients (48.9%). The most common type of RCC was the clear cell variant, representing 69% of cases, followed by papillary RCC (14%), chromophobe RCC (7%), cystic nephroma (1.4%), Ewing's sarcoma (1.4%), mucinous spindle RCC (1.4%), oncocytoma (4.2%), leiomyoma (1.4%), and AML (2.8%). Lymphovascular invasion (LVI) was present in 24.7% of cases, and perinephric fat invasion was present in 20.5% of cases. The most common involvements were of PCS (23.3%) and renal vein (13.7%). Most cases were graded as 2 according to the ISUP grading system (49.2%). The most frequent stage was PT3A (40%). **Conclusion:** These findings provide valuable insights into the epidemiology and characteristics of renal tumors, facilitating further research and informing clinical management strategies

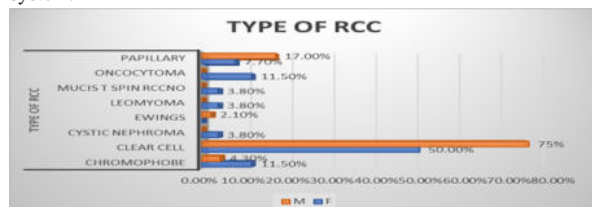
KEYWORDS : RENAL CELL CARCINOMA, RCC, HISTOPATHOLOGY, CLEAR CELL CARCINOMA.

INTRODUCTION

The incidence of Renal Cell Carcinomas (RCCs) has been steadily increasing, making them the seventh most common type of cancer worldwide. This study aimed to evaluate the characteristics of RCC patients, focusing on age distribution, sex distribution, clinical presentation, tumor laterality, staging, and histopathological features.

MATERIALS AND METHOD

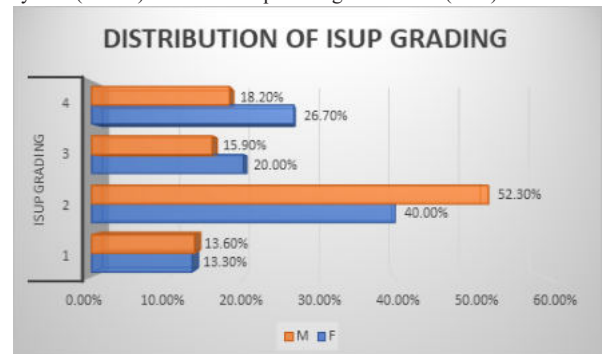
A retrospective descriptive study was conducted at the Department of Urology, Rajiv Gandhi Government General Hospital in Chennai, India, from January 2020 to December 2023. The study collected data on various aspects, including demographic characteristics, types of renal cell carcinoma (RCC), the tumor's location, histopathological features, tumor grade and stage, lymphovascular invasion, perinephric fat invasion, involvement of the pelvicalyceal system, percentage of necrosis, renal vein involvement, and any association with sarcomatous or rhabdoid features. Additionally, the study utilized the International Society of Urological Pathology (ISUP) nuclear grading system.



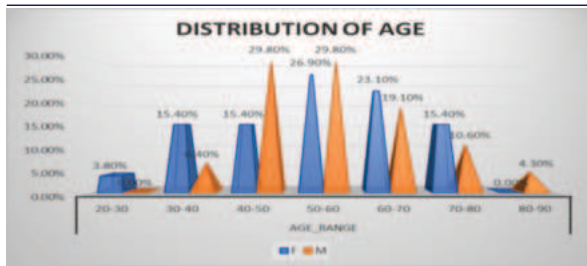
RESULTS

This study involved 73 patients diagnosed with renal cell carcinoma (RCC). Of these, 47 were male and 26 were female. Most patients were in the 50-60 age group (26.9%). Left kidney involvement was observed in 38 patients (51.1%), while right kidney involvement was observed in 35 patients (48.9%). The most common type of RCC was the clear cell variant, representing 69% of cases, followed by papillary RCC (14%), chromophobe RCC (7%), cystic nephroma (1.4%), Ewing's sarcoma (1.4%), mucinous spindle RCC (1.4%), oncocytoma (4.2%), leiomyoma (1.4%), and AML (2.8%). Lymphovascular invasion (LVI) was present in 24.7% of cases, and

perinephric fat invasion was present in 20.5% of cases. The most common involvements were of PCS (23.3%) and renal vein (13.7%). The majority of cases were graded as 2 according to the ISUP grading system (49.2%). The most frequent stage was PT3A (40%).



SEX	F	26	35.6%
	M	47	64.4%
SIDE	LEFT	38	52.1%
	RIGHT	35	47.9%
TYPE OF RCC	CHROMOPHOBE	5	6.8%
	CLEAR CELL	49	66%
	CYSTIC NEPHROMA	1	1.4%
	EWINGS	1	1.4%
	LEIOMYOMA	1	1.4%
	MUCIS T SPIN RCCNO	1	1.4%
	ONCOCYTOMA	3	4.1%
	PAPILLARY	10	13.7%
LVI	ABSENT	47	64.4%
	PRESENT	18	24.7%
PERINEPHRIC FAT INVASION	ABSENT	51	69.9%
	PRESENT	15	20.5%
PCS INVOLVEMENT	ABSENT	49	67.1%
	PRESENT	17	23.3%
ISUP GRADING	1	8	13.6%
	2	29	49.2%
	3	10	16.9%
	4	12	20.3%
SARCOMATOID CHANGES	ABSENT	59	80.8%
	PRESENT	6	8.2%
RENAL VEIN INVOLVEMENT	ABSENT	56	76.7%
	PRESENT	10	13.7%
AGE_RANGE	20-30	1	1.4%
	30-40	7	9.6%
	40-50	18	24.7%
	50-60	21	28.8%
	60-70	15	20.5%
	70-80	9	12.3%
	80-90	2	2.7%



DISCUSSION

This study aims to evaluate the epidemiological and histopathological characteristics of renal cell carcinoma (RCC) at a tertiary hospital in Tamil Nadu. Incidence rates of this cancer vary significantly around the world. North America has the highest estimated incidence globally, with cumulative risks of 1.8% for males and 0.9% for females. In Western Europe, the incidence rate for both sexes is around 9.8%, while Africa has the lowest incidence and mortality rates, with cumulative risks below 0.2% for both males and females.

In our study, we found that 65% of the affected individuals are male and 35% are female, which is consistent with findings from European literature. There is a slightly higher incidence of RCC in the left kidney (58%) compared to the right kidney (48%).

More than 90% of renal cell carcinomas identified in our study are of the conventional type, which includes clear cell, papillary, and chromophobe RCCs. The remaining 10% are non-conventional types, with renal oncocytoma being the most common among them. The most predominant age range for RCC is 50-60 years, accounting for 28.8% of cases. For females, the most common age ranges are 50-60 years (26.9%), followed by 60-70 years (23.1%) and 40-50 years (15.4%). In males, the most affected age ranges are 40-50 years (29.8%) and 50-60 years (29.8%), followed by 60-70 years (19.1%).

Additionally, we observed that renal vein involvement is absent in 81.8% of cases among females and present in 19.2% of cases. Among males, renal vein involvement is absent in 89.4% of cases and present in 10.6% of cases. The reason for this may be delayed presentation of female patients to the hospital. These findings provide valuable insights into the epidemiology and characteristics of renal tumors, facilitating further research and informing clinical management.

This data provides a comprehensive overview of various aspects of renal tumors, covering the distribution by sex, affected side, tumor type, lymphovascular invasion (LVI), perinephric fat invasion, involvement of pelvicalyceal system (PCS), ISUP grading, percentage of necrosis, presence of sarcomatoid changes, tumor stage, and renal vein involvement.

Key findings include:

- Males represent the majority of cases (64.4%), while females comprise 35.6%.
- Clear cell renal cell carcinoma (RCC) is the most prevalent type, accounting for 65.8%.
- Lymphovascular invasion (LVI) is present in 24.7% of cases, along with perinephric fat invasion in 20.5%.
- The majority of cases show no PCS involvement (67.1%) and renal vein involvement (76.7%).
- ISUP grading indicates that grade 2 is the most common, representing 49.2% of cases.
- In terms of staging, PT3A (13.7%) and T3A (27.4%) are the most frequently observed stages.
- The most common age range for diagnosis is between 50-60 years.

CONCLUSION

These findings provide valuable insights into the epidemiology and characteristics of renal tumors, facilitating further research and informing clinical management strategies.

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