(RESEARCH ARTICLE)

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Clinicopathological profile of renal cell carcinoma at the anatomical pathology laboratory, Saiful Anwar General Hospital from 2019 until 2023

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Abstract

Renal Cell Carcinoma (RCC) represents about 2% of all cancers worldwide, denotes cancer originated from renal epithelium and accounts for >90% of cancers in the kidney, and is more commonly seen in men than women. The histologic classification of RCC based on histologic subtypes is Clear Cell, Chromophobe, and Papillary. Since of RCC is different across regions and may change over time, global distribution patterns, risk factors need to be assessed to developing measures and prevention. The purpose of this study was to analyze RCC patients based on histopathological type, age, and gender. This study is a descriptive analytic study. The data was collected from RCC patients at the Anatomical Pathology Department of Dr. Saiful Anwar Hospital between 2019 and 2023, all of whom underwent histopathological examinations. A total of 77 RCC cases were identified, with an average age group of 51-60 old age group (4.28%) and a higher prevalence in men (52%). The most frequent histopathological type was Clear Cell Renal Cell Carcinoma (74%), followed by Papillary Renal Cell Carcinoma (15.6%) and Chromophobe Renal Cell Carcinoma (10.4%)

Keywords: Renal Cell Carcinoma; Retrospective; Clear Cell Renal Cell Carcinoma; Histopathology

1. Introduction

According to the World Health Organization (WHO), Renal Cell Carcinoma (RCC) represents about 2% of all cancers worldwide and is the 2% most common cause of death in 2020 there were new cases in men (6.1 cases per 100.000 population) and 160.039 cases in women (3.2 cases per 100.000 population). The male:female ratio was 1,24: 1 in 1990 and 1.58: 1 in 2017. Kidney cancer currently ranks as the seventh most common cancer in men and tenth in women [1].

Risk factors for kidney cancer are smoking, obesity, and hypertension. Long-term dialysis makes the risk of RCC higher, due to Acquired Chronic Kidney Disease [2]. There is an increased risk when an increase in body mass index occurs at the age of 50 years. Obesity is associated with endocrine disruption, accompanied by decreased globulin and progesterone levels, insulin resistance, and increased levels of growth factors such as IGF1, which can be a cause of carcinogenesis [1].

Common symptoms are hematuria, flank pain, palpable mass in the abdomen. Approximately 20-30% of patients have metastasis at the initial stage of diagnosis, 40% of patients with RCC have distant metastasis, most often including the lungs, bones, brain, can also affect the adrenal glands, other side of the kidney, and liver [3].

WHO classifies RCC into different subtypes based on their morphology, molecular, and genetics. RCC is derived from Clear Cell, Papillary, Chromopobe subtypes [3].

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Clear cell RCC is the most common and aggressive subtype, most likely to metastasize hematogenously to the lungs, liver and bone. Papillary RCC is distinguished from clear cell histologically by the presence of basophilic or eosinophilic cells in a papillary or tubular architecture. Type 1 (basophilic) has a higher rate and is often associated with ganglial metastasis and venous invasion than type 2 (eosinophilic) tumors. Chromopobe RCC represents 5% of cases with the best prognosis as metastasis occurs in only 7% of cases [4].

Epidemiological research on the clinicopathological profile of RCC cases at RSUD dr. Saiful Anwar Malang has never been done. Thus, the purpose of this study was to determine the clinicopathological profile of RCC based on histopathology type, age, and gender during 2019 to 2023 at Saiful Anwar General Hospital Malang.

2. Material and methods

This study is a descriptive analytic. Data were collected from medical records during 2019 to 2023 at the Anatomical Pathology Installation of Dr. Saiful Anwar Hospital Malang. The population in this study were patients with renal tumor who underwent histopathological examination at the Anatomical Pathology Laboratory of Dr. Saiful Anwar Hospital Malang from 2019 to 2023, and the subjects in this study were patients with RCC. The sampling method is total sampling.

Inclusion criteria were patients diagnosed with RCC based on histopathology examination with complete medical records (histopathology, age, and gender). After the data was collected, it was presented in the form of tables and diagrams.

3. Results and discussion

In this study, 77 cases of RCC were collected through medical records. The average incidence of RCC was 15 cases per year.

Table 1 Number of cases of renal cell carcinoma

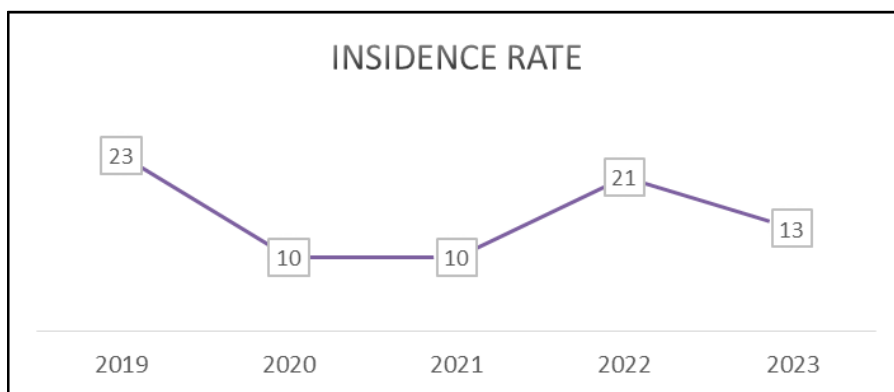| Years	Number of RCC cases	Frequency of RCC
2019	23	29.9 %
2020	10	13 %
2021	10	13 %
2022	21	27.2 %
2023	13	16.9 %
Total	77	100%

Figure 1 Incidence rate of Renal Cell Carcinoma per year

According to Figure 1, in this study, RCC cases had the highest incidence rate in 2019 with 23 cases (29.9%), while the lowest incidence rate of RCC was in 2020 and 2021 with 10 cases (13%), meanwhile decrease in 2023. This can happen because the government has a better referral system to provide health services so that RCC cases can be detected earlier, as well as public awareness of the importance of regular health checks [3].

Table 2 Number of cases of Renal Cell Carcinoma by Gender

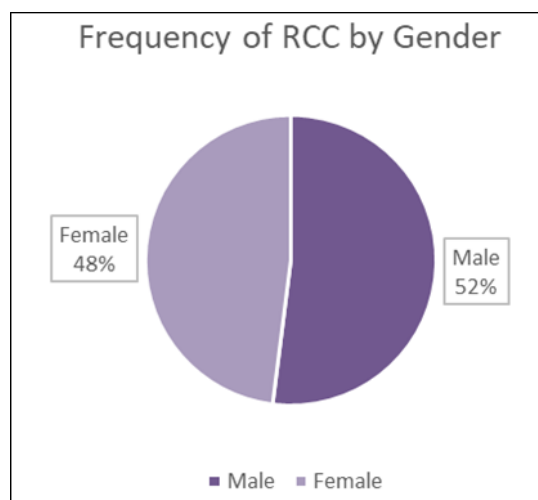| Gender	Males	Females
Amount	40	37
Presentage	52 %	48 %

Figure 2 Renal Cell Carcinoma frequency by gender

There is an increase in the incidence of RCC with age. In this study, the increase in RCC cases began at 41 years and decreased after the age of 60 years. This is in accordance with the results of a retrospective study conducted by Wildansyah et al. at Dr. Hasan Sadikin Bandung Hospital from 2013 to 2018, which stated that the average age of renal cell carcinoma patients was 58 years [6]. RCC affects men twice as much as women, and is most often diagnosed as early as 60 years of age [2].
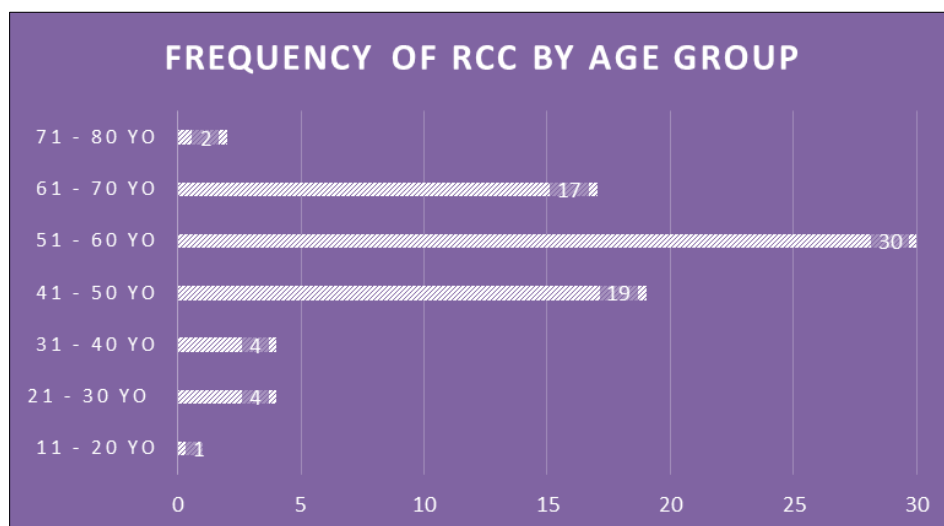

Figure 3 Frequency of RCC by Age

According to Figure 3, most of the RCC cases in this study occurred in patients aged between the 5th and 7th decades, or between 51-60 years old.

The histological classification of RCCs is of utmost importance, considering the significant prognostic and therapeutic implications of its histological subtype, and hence the relevance of the role played by the radiologist in the preoperative imaging recognition of the histological RCC subtypes. Currently, better results have been achieved in the differentiation between clear cell renal cell carcinomas and non-clear cell RCCs in the daily clinical practice [5].

Table 3 Frequency of RCC Based on Histopathology Type

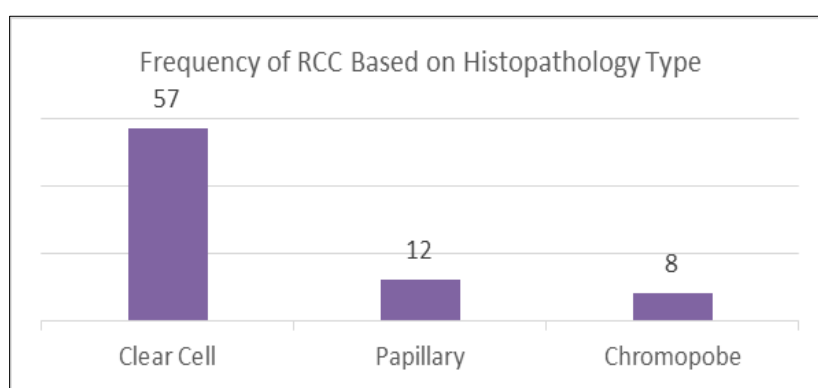| Histopathological Type	Frequency	Presentage
Clear Cell	57	74 %
Papillary	12	15.6 %
Chromopobe	8	10.4 %
Total	77	100 %

Figure 4 Frequency of RCC Based on Histopathology Type

According to the diagram in Figure 4, from a total of 77 RCC cases that became subjects in this study, Clear Cell Renal Cell Carcinoma is the most common subtype with 57 cases (74%), followed by Papillary Renal Cell Carcinoma with 12 cases (15.6%), and Chromopobe Renal Cell Carcinoma with 8 cases (10.4%). WHO data classifies RCC into several subtypes based on morphology, molecular, and genetics. The most common histologic subtypes are Clear Cell, Papillary (type I and II), and Chromopobe. Clear Cell and Papillary RCC types originate from proximal tubules that are most likely to metastasize hematogenously to the lungs, liver, and bones, while the Chromopobe type originates from Distal Connecting Tubules (DCT) [3], and has the best prognosis and the incidence of metastasis is only 7% of cases [4]. This is in accordance with the results of research at Dr. Hasan Sadikin Bandung Hospital that Clear Cell Renal Cell Carcinoma is the most histopathological type among other types of RCC [6].

4. Conclusion

From total of 77 cases or Renal Cell Carcinoma mostly occurred during 2022, with percentage higher in men (52%) than women (48%), and increases with age until it peaks between the ages of 51-60 years old age group. The most common histopathological type is Clear Cell Renal Cell Carcinoma (74%).

Compliance with ethical standards

Acknowledgments

Disclosure of conflict of interest

Authors declare no conflict of interest in constructing this manuscript.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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