Kidney Cancer Profile in National Cancer Center (NCC) - Dharmais Cancer Hospital

Diki Arma Duha 1*, Edward Usfie Harahap 2, Rachmat Budi Santoso 2, Ikhas Arief Bramono 2

1 Department of Urology, Cipto Mangunkusumo National Referral Hospital/Universitas Indonesia, Jakarta, Indonesia
2 Department of Urology, Dharmais Cancer Hospital – National Cancer Center, Jakarta, Indonesia

INTRODUCTION

Kidney cancer incidences were reported in 403,262 cases worldwide in 2018, both male and female sexes, causing 175,098 deaths of all cancer based on GLOBOCAN data [1]. In several Asian countries such as Korea, China, Hong Kong, and Japan, kidney cancer prevalence has increased [2,3]. It has been speculated that the rising global incidence of kidney cancer is due to a higher prevalence of risk factors (e.g., cigarette smoking, obesity, and hypertension). There were improvements in diagnosis, where modern imaging techniques have led to increased incidental detection, usually through magnetic resonance imaging (MRI) and computed tomography (CT) scans [4,5].

The “classic triad” of signs (hematuria, flank pain, and palpable masses) is present in just 10% of patients in the late stage. The patients may show symptoms of paraneoplastic syndromes which are quite uncommon in kidney cancer patients. Studies have shown one-third of cases of renal cell carcinoma (RCC) are diagnosed at the metastatic phase worldwide and about 45% of cases of RCC in Indonesia are diagnosed at the later stages [5,6]. The most common type of kidney cancer is renal clear cell (80–90%) [7–10].

ARTICLE INFO

Received : 15 January 2022
Reviewed : 01 March 2022
Accepted : 13 June 2022

Keywords:
cyto-reductive, epidemiology, kidney cancer, nephrectomy, renal cell carcinoma

*Corresponding author:
Diki Arma Duha
Department of Urology, Cipto Mangunkusumo National Referral Hospital, Faculty of Medicine, Universitas Indonesia, Salemba Raya Street No. 06, Central Jakarta, Indonesia
dikiarmaduha@gmail.com

ABSTRACT

Background: Kidney cancer is one of the most prevalent cancers in urology. The higher prevalence of risk factors, as well as better diagnostic modalities, has led to a reported increase worldwide. The study aims to describe the profile and management pattern of kidney cancer patients at a tertiary referral center over seven years.

Methods: A descriptive study was conducted to assess the profile and management of kidney patients in the national cancer center (NCC) - Dharmais Hospital Jakarta between January 2013 and December 2020. The variables collected included age, gender, stage (AJCC staging), histopathological result, and management, using the total sampling method.

Results: A total of 53 kidney cancer cases were documented in NCC - Dharmais Hospital Jakarta from 2013 to 2020. Overall, males are more prevalent than females, with a sex ratio of 2.3:1. The most frequent age group was 51–65 years. The most common histological subtype was a clear cell in the renal cell carcinoma (RCC) subtype and sarcoma in the non-RCC subtype. Noticeably, end-stage (stage IV) was found in more than half of patients (65.6%), with no patient found in stage I. Radical nephrectomy was preferable to cytoreductive nephrectomy.

Conclusions: An increasing trend of kidney cancer incidence was found between 2013 and 2020 with most patients diagnosed with stage IV.
METHODS

Design and samples
This descriptive study determined the profile and management of kidney cancer patients in NCC - Dharmais Hospital Jakarta from 2013 to 2020. It used total sampling, covering all kidney cancer cases documented in our center from January 2013 until December 2020. The study received ethical clearance from the Medical Research Ethics of the Dharmais Cancer Hospital with ethical clearance number 093/KEPK/IX/2021.

We extracted electronic medical records to obtain patients’ demographical data. Histopathological, cancer staging, and treatment data were subsequently obtained from the medical record. Histopathological data were divided into RCC and non-RCC. The cancer staging was determined according to the American Joint Committee on Cancer (AJCC) for kidney cancer. Treatments in this study were radical nephrectomy or cytoreductive nephrectomy. All data are presented in frequency and percentage.

RESULTS
There was a total of 53 cases of kidney cancer from 2013 to 2020. The characteristics of the respondents are presented in Table 1. The most frequent age group of kidney cancer cases was found in the range of 51–65 years with more males than females (2.3:1). The most common RCC subtype found was clear-cell RCC, and the non-RCC was sarcoma. Most cases were found at stage IV, and radical nephrectomy was the most treatment undertaken (Table 2). There was an increasing incidence with the increase in stage IV of kidney cancer from one case in 2013 to fourteen cases in 2020 (Figure 1).

DISCUSSION
The kidney cancer incidence pattern in this study from 2013 to 2020 showed increasing trends each year from 1 new case in 2013 to 14 in 2020. This finding is in line with the global trend, where there has been an average increase in kidney cancer incidence of 3–4% per year [11]. A similar tendency was also found in the United States, where there was an increase of 2.421% per year from 1992 until 2015 [12]. This study also shows the highest kidney cancer cases in the age group above 50 (49.06%), which is quite similar to the finding of Hajgude et al. [15] in which the age group between 51 and 60 years was the highest (36.13%). Older age and gender have been strong risk factors for the occurrence of kidney cancer. Gelfond et al. [16] found that males had a 1.85 higher risk of developing kidney cancer, which is quite similar to the finding in this study. Thorstenson et al. [23] and Rao et al. [29] also recorded a similar ratio of male-to-female.

The higher prevalence of males is believed due to the role of sex hormones in RCC progression [17]. Mancini et al. [17] discussed this in their study that higher Androgen Receptor (AR) was found in clear cell RCC. The higher rate of AR in RCC had been studied in the last decade, but recent studies have shown varied results. Zhu et al. [18] showed no statistically significant difference in the rate of AR-positive RCC in men and women. Meanwhile, Chen et al. [19] showed that higher AR expression has a promoting effect on RCC proliferation. This phenomenon may be the result of the unique mechanisms of the Androgen Receptor which can either increase or decrease RCC proliferation and

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>37 (69.8)</td>
</tr>
<tr>
<td>Female</td>
<td>16 (30.2)</td>
</tr>
<tr>
<td>Age, years old</td>
<td></td>
</tr>
<tr>
<td>&lt;18</td>
<td>9 (16.9)</td>
</tr>
<tr>
<td>18–34</td>
<td>3 (5.6)</td>
</tr>
<tr>
<td>35–50</td>
<td>15 (28.3)</td>
</tr>
<tr>
<td>51–65</td>
<td>32 (59.8)</td>
</tr>
<tr>
<td>&gt;65</td>
<td>7 (13.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stage</th>
<th>Frequency, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I (T1)</td>
<td>0 (0)</td>
</tr>
<tr>
<td>Stage II (T2)</td>
<td>2 (6.2)</td>
</tr>
<tr>
<td>Stage III (T3/ T1-3 with N+)</td>
<td>9 (28.1)</td>
</tr>
<tr>
<td>Stage IV (T4/ any T any N with M+)</td>
<td>21 (65.6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Frequency, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radical nephrectomy</td>
<td>30 (56.8)</td>
</tr>
<tr>
<td>Cytoreductive nephrectomy</td>
<td>21 (41.2)</td>
</tr>
</tbody>
</table>

**Table 2. Kidney cancer profile**
metastasis that is found in the study by Huang et al. [20]. Another sex hormone that is a factor in the gender ratio is estrogen in women. Estrogen is found to have a protective effect on RCC proliferation acting as a tumor suppressor. Estrogen stimulation and estrogen receptor-β (ERβ) activity promotes the inhibition of RCC proliferation and induces apoptosis acting as the downregulator [17,21]. Other factors associated with gender ratio in RCC are sociocultural and health-related behaviors such as smoking, hypertension, and obesity [17].

From this study, the renal clear cell has the most common histopathological finding. It is similar to other international epidemiology studies showing clear cell RCC accounts for 70–80% of all RCC cases in Asia [3,22]. Clear-cell RCC contributed to almost 80–90% of all kidney cancers worldwide [23]. Renal sarcoma is the most common Non-RCC histological finding in this study, consisting of 15.09% of patients. Renal sarcoma is a rare renal malignancy [24], appearing in only 0.8–2.7% of malignant renal cancer [25,26]. Sarcoma is commonly present in pediatric patients and is associated with high mortality, recurrence, and metastasis [26].

In this study, nephroblastoma was the most common histopathological diagnosis in pediatrics. It is the most common abdominal cancer found in childhood with girl cases slightly more common than boys [27]. In the USA, Wilms’ tumor incidence is 7.6 cases per million in patients under 15 years old with 500 new cases yearly. The incidence of Wilms’ tumor in the Asian population is lower compared to that in Western countries. Asian patients were also found to have fewer unfavorable histologic tumors and had better survival outcomes [27]. In Turkey, pediatric kidney tumor represents 7.1% of all pediatric tumors. Wilms’ tumor is commonly seen in children aged 1 and 5 years with a peak age of 3 years [28].

This report also shows that 65.6% of cases found were in stage IV, which is higher than kidney cancer statistics in Asia in 2012, where metastatic cases were found in 20–30% of cases and higher than statistics worldwide [9]. Padala et al. [5] showed that around 45% of RCC was found in the metastatic stage. This may be attributed due to the data acquired from a national cancer center, as a referral center.

Radical nephrectomy is the most frequent treatment performed found in this report. According to The European Association of Urology (EAU) Guideline 2020, the recommendation for radical nephrectomy is strong for T2 tumors with no metastasis (Stage II or stage III). Although there is a rising number of options for nephron-sparing surgery, radical nephrectomy is still considered the gold standard for localized kidney cancer[29]. Radical nephrectomy technique has also been developed over the years. A meta-analysis by Wang et al. [30] showed that Laparoscopic radical nephrectomies had significantly less blood loss during operations and less post-operative hospital length of stay in RCC cases. That study included 1,289 cases of radical nephrectomies in Korea and China. This may suggest that cases in this study with unknown stages may be earlier than stage II or III treated with radical nephrectomies.

Cytoreductive nephrectomies were performed for metastatic kidney cancer (39.62%). A study by Xiao et al. [31] showed that cytoreductive nephrectomy significantly improved the survival rate of metastatic-clear cell-renal cell carcinoma (mCCRCC) compared to patients who had no surgery therapy. Patients with no surgery had 1-, 2-, and 3-year cancer-specific survival rates of 45.1%, 27.9%, and 21.7%, respectively. Meanwhile, patients who underwent cytoreductive nephrectomy surgery had 70.6%, 52.2%, and 41.7% survival rates, respectively (P <0.001). Cytoreductive nephrectomies are strongly recommended for treating kidney cancer with simultaneous complete resection of single or oligo metastasis [32]. It is suggested that debulking the
primary tumor reduces tumor burden and eliminates the source of metastasis, causing palliation of local symptoms and better response to systemic therapy [7].

CONCLUSIONS

This 7-year single-center study concluded that the trend of kidney cancer incidence increased from 2013 until 2020, with most patients diagnosed at stage IV. Kidney cancer is predominantly in males with an age range of 51–65 years. The most frequent histological subtype was a clear cell in the RCC subtype and sarcoma in the non-RCC subtype with the most treatment performed being radical nephrectomy.

DECLARATIONS

Ethics Approval
The study received ethical clearance from the Medical Research Ethics of the Dharmais Cancer Hospital with ethical clearance number 093/KEPK/IX/2021.

Competing of Interest
The authors declare no competing interest in this study.

Acknowledgment
None

REFERENCES


