



# Evaluation of General Characteristics of Renal Cell Carcinoma Patients: A Single Center Experience

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## Abstract

**Objective:** Renal cancer (RC) accounts for 3.2% of all newly diagnosed cancers and approximately 90% of RC cases are renal cell carcinoma (RCC). Smoking and hypertension are the most important risk factors. The aim of our study was to evaluate the general characteristics of RCC patients in Bolu, Turkey.

**Materials and Methods:** Patients who visited our medical oncology clinic and were diagnosed with RCC between January 1<sup>st</sup>, 2012 and May 31<sup>st</sup>, 2017 were evaluated retrospectively.

**Results:** Eighty-one patients were diagnosed with RCC during the study period. The median age of the patients was 62 years (range: 38-87 years). Fifty-seven (70.4%) of the patients were male and 24 (29.6%) were female. Thirty patients (37.1%) were diagnosed incidentally. Forty-eight (59.3%) of the patients were smokers. The most common comorbidity was hypertension (58%). Radical nephrectomy was performed in 59 (72.8%) of the patients. The most common histological subtype was clear cell carcinoma (72.8%) and 39 (48.1%) were stage 1 when evaluated according to the stage of RCC. Of the 16 patients with metastatic disease, 11 (13.6%) received interferon therapy, and 5 patients (6.2%) refused treatment. After interferon treatment, 7 patients received targeted therapy with sunitinib/pazopanib as second-line treatment, 5 received everolimus as third-line treatment, and 3 received axitinib treatment as fourth-line treatment. Ten patients with bone metastasis underwent palliative radiotherapy. The median follow-up time of the patients was 21 months (0-123 months). Sixty-five patients (80.2%) survived this period.

**Conclusion:** Smoking cessation and effective treatment of hypertension, preventable etiological factors of RCC, and incidental diagnosis of early RCC are very important. With early diagnosis, the partial nephrectomy rate might be increased.

**Keywords:** Renal cell carcinoma, etiology, Bolu

## Introduction

Renal cancer (RC) accounts for 3.2% of all newly diagnosed cancers, 4.1% in males and 2.5% in females (1). Approximately 90% of RCs are renal cell carcinoma (RCC). Based on tumor morphology, immunohistochemistry, cytogenetics, and other molecular studies, the subtypes of RCC are clear cell, papillary, chromophobe, and collecting-duct or Bellini duct tumors. The most common subtype of RCC is clear cell carcinoma,

with a rate of approximately 80% (2,3,4). Cigarette smoking and hypertension are the most important risk factors in the development of RCC (5,6). Surgery is very important in the treatment of RCC (7). As more patients are diagnosed in the early stages, partial nephrectomy is increasingly used instead of radical nephrectomy for treatment. RCC is a radioresistant tumor; thus, radiotherapy (RT) cannot be used in its treatment. RT can only be performed as palliative treatment in conditions such as brain and bone metastasis (8,9). Systemic treatment is not necessary

until RCC has reached the metastatic stage. Targeted treatment agents such as sunitinib, pazopanib, sorafenib, bevacizumab, axitinib, everolimus, and temsirolimus are used in the treatment of metastatic disease (10,11). Our study aimed to evaluate the general characteristics of patients with RCC in Bolu, Turkey.

## Materials and Methods

The written and digital records of patients with RCC who were diagnosed between January 1<sup>st</sup>, 2012 and May 31<sup>st</sup>, 2017 at the Department of Medical Oncology Outpatient Clinic of Abant İzzet Baysal University Faculty of Medicine were reviewed retrospectively. Age, gender, symptoms at presentation, smoking and alcohol habits, comorbid diseases, family history of cancer, surgical modality, tumor histology, tumor diameter, grade, stage, metastasis location, medical treatment, and final follow-up dates of the RCC patients were recorded.

## Results

A total of 1870 patients visited our outpatient clinic between January 1<sup>st</sup>, 2012 and May 31<sup>st</sup>, 2017, 81 (4.3%) of whom were diagnosed with RCC. The median age of the patients was 62 years (range: 38-87 years). Forty-nine (60.5%) of the patients were less than 65 years of age and 32 (39.5%) were over 65 years of age. Fifty-seven (70.4%) of the patients were male and 24 (29.6%) were female.

For 30 patients (37.1%) the renal mass was detected incidentally. Presenting symptoms in the other patients included abdominal pain in 26 patients (32.1%), hematuria in 7 (8.6%), abdominal pain and hematuria in 6 (7.4%), weight loss and fatigue in 6 (7.4%), and back pain in 6 patients (7.4%).

Forty-eight (59.3%) of the patients smoked cigarettes and 33 (40.7%) did not smoke. Twenty women (83.3%) and 28 men (49.1%) smoked. The smoking duration of the patients was 33 pack-years (range: 6-100 pack-years). Seventy-five (92.6%) of the patients did not use alcohol, while 6 (7.4%) consumed alcohol.

Forty-three (53.1%) of the RCC patients had comorbid diseases and 38 (46.9%) did not. These comorbidities included hypertension in 25 patients (58.1%), second primary cancer in 7 (16.3%), diabetes mellitus in 6 (13.9%), and hypertension plus diabetes mellitus in 5 patients (11.7%). Seventy patients (86.4%) had no family history of cancer, while 11 patients (13.6%) had a family history of cancer. The patients' Eastern Cooperative Oncology Group (ECOG) performance status was evaluated as grade 1 in 70 patients (86.4%), grade 2 in 8 patients (9.9%), and grade 3 in 3 patients (3.7%) (Table 1).

Radical nephrectomy was performed in 59 patients (72.8%), partial nephrectomy was performed in 17 patients (21%), and 5 patients with metastases did not undergo surgery. Histological subtype was clear cell carcinoma in 59 patients (72.8%), papillary carcinoma in 12 (14.8%), chromophobe cell carcinoma in 8 (9.9%), and collecting duct tumor in 2 patients (2.5%). The median tumor diameter was 6 cm (range: 1.7-18 cm). Tumor diameter was less than 7 cm in 49 (60.5%) of the patients and 7 cm or greater in 32 patients (39.5%). Tumor grade was grade 1 in 12 patients (14.8%), grade 2 in 27 (33.3%), grade 3 in 23 (28.4%), and could not be evaluated in 19 patients (23.5%). Tumors were stage 1 in 39 patients (48.1%), stage 2 in 19 patients (23.5%), stage 3 in 7 patients (8.6%), and stage 4 in 16 patients (19.8%).

Bone metastasis occurred in 9 patients (56.2%), lung metastasis occurred in 5 (31.2%), surrenal metastasis occurred in 1 (6.3%), and multiple metastases such as lung, liver, and bone metastases occurred in 1 patient (6.3%). Sixty-five patients (80.2%) had postoperative follow-up. Interferon treatment was given to 11 patients (13.6%) who had metastasis, and five patients (6.2%) refused treatment. Seven patients received sunitinib/pazopanib as second-line treatment, 5 received everolimus as third-line treatment, and 3 patients received axinitinib treatment as fourth-line treatment. Palliative RT was applied to 10 patients with bone metastasis. No patient had brain metastases. The median follow-up time of the patients was 21 months (range: 0-123 months). During this time, 65 patients (80.2%) survived (Table 2).

		n	%
Gender	Female	24	29.6
	Male	57	70.4
Cigarette smoking	Yes	48	59.3
	No	33	40.7
Alcohol consumption	Yes	6	7.4
	No	75	92.6
Comorbid diseases	Hypertension	25	58.1
	Second primary cancer	7	16.3
	Diabetes mellitus	6	13.9
	Diabetes mellitus + hypertension	5	11.7

		n	%
Operation	Radical nephrectomy	59	72.8
	Partial nephrectomy	17	21
	No	5	6.2
Histological subtype	Clear cell carcinoma	59	72.8
	Papillary cell carcinoma	12	14.8
	Chromophobe cell carcinoma	8	9.9
	Collecting duct tumor	2	2.5
Tumor diameter	<7 cm	49	60.5
	>7 cm	32	39.5
Stage	1	39	48.1
	2	19	23.5
	3	7	8.6
	4	16	19.8
Treatment	Postoperative follow-up	65	80.2
	IFN	11	13.6
	Treatment refusal	5	6.2

IFN: Interferon

## Discussion

RCC is an age-related disease and is more common in men than in women. According to Surveillance, Epidemiology and End Results Program (SEER) data, the average age at diagnosis is 64 years (12). In a study about RCC conducted by Türk et al. (13), 70% of the patients were male, and the median age of the patients was 57 years. In another study conducted in patients with RCC, 58.5% of the patients were male, and the median age was 57 years (14). The proportion of male patients in our study was greater than that of female patients. The median age at diagnosis in our study, 62 years, was higher than the studies cited above and was similar to that in the SEER data.

Cigarette smoking is currently considered the most important risk factor in the development of RCC. According to SEER data, 20-30% of men and 10-20% of women diagnosed with RCC are smokers (12). In the VITAL study, there was a relationship between cigarette smoking and RCC formation, but no relationship was found with alcohol consumption (15). In our study, 59.3% of the patients were cigarette smokers, and only 7.4% of patients consumed alcohol. Twenty women (83.3%) and 28 men (49.1%) were smokers. Unlike the aforementioned studies, the smoking rate in our study was higher in women than in men. This is mainly due to women being more addicted than men to cigarette smoking and the fact that the prevalence of smoking is presently increasing in women but decreasing in men (16).

Hypertension is also important in the etiology of RCC. Some researchers believe that arterial hypertension arises due to vasoactive amines secreted by RCC and causes RCC formation (15,17,18). Chow et al. (19) observed a relationship between elevated blood pressure and risk of RCC development, and they found that the risk might be decreased with time if blood pressure was well controlled. In another study, it was found that the risk of RCC development was over 2.4 times greater in patients with high blood pressure (20). In our study, hypertension was noted in half of the patients. Effective treatment of hypertension, which plays a significant role in RCC etiology, is very important.

Clear cell carcinoma (80-90%), papillary carcinoma (10-15%), and chromophobe carcinoma (4-5%) are the most common histological subtypes of RCC (21). In a study in which Kuş et al. (22) assessed the histopathological features of RCC patients, the most common histological subtype was clear cell carcinoma, accounting for 88.6% of cases. In another study concerning histological subtype, clear cell carcinoma was the most common subtype with a rate of 85% (13). Consistent with these studies, we also found that the most common histological subtype among our patients was clear cell carcinoma.

Approximately 65% of patients with RCC are asymptomatic in terms of clinical and laboratory factors and are usually diagnosed incidentally (23,24). In particular, the symptom-based diagnosis rate of RCC patients has been reduced because of easier access and more frequent use of abdominal ultrasound and computed tomography. The proportion of incidentally diagnosed patients has increased 3 fold within 20 years (25,26). In our study, the incidental diagnosis rate of RCC was greater than diagnosis by other means.

In terms of tumor stage, a study evaluating 198 patients with RCC reported higher proportions of stage 1 and stage 2 tumors

than metastatic disease (14). In another study of the clinical and histopathological features of 230 patients with RCC, the number of stage 1 patients was 110 (49%), a high rate (13). In keeping with the increase in the use of radiological diagnostic tests, the proportion of stage 1 patients in our study was 48.1%, similar to that in recent studies.

Surgery for localized RCC disease is usually curative treatment. Local ablation, partial nephrectomy, or total nephrectomy may be performed, depending on tumor size (27). Similar local recurrence rates have been reported with partial nephrectomy and local ablation therapy. None of the patients in our study underwent local ablative treatment (28). In another study performed in the last 15 years, total nephrectomy was still performed, although the partial nephrectomy rate in patients with a tumor diameter less than 2 cm increased from 15.3% to 61.1%. If the tumor diameter was 2-2.9 cm, the rate increased from 11.0% to 44.2%; if the tumor diameter was 3-3.9 cm, the rate was increased from 7.2% to 31.1% (29). In our study, the total nephrectomy rate was higher than the partial nephrectomy rate.

RT is administered as palliative treatment for bone and brain metastases. In fact, RCC is a radioresistant tumor (30,31,32). No brain metastatic patients were found in our study. Ten patients with bone metastasis had palliative RT treatment.

Targeted therapies are used in metastatic RCC patients. In a recent study comparing the molecular targeted agent sunitinib to interferon, sunitinib yielded higher disease-free survival and response rates. Additionally, in another recent study, pazopanib and sunitinib showed similar efficacy in metastatic disease (33,34). Despite these findings, due to the policies of the Turkish Ministry of Health, interferon is still used as first-line therapy for metastatic RCC. In our study, interferon therapy was started in 11 of the metastatic patients, and 7 patients who showed progression with interferon treatment were treated with targeted agents. Five patients refused treatment.

In our study, the median follow-up time was 21 months, and 65 patients survived. In another study, the median follow-up time was 33 months and 57 patients survived (35). In yet another study, 61 patients survived and the median follow-up time was 46 months (36).

### Study Limitations

Limitations of this study include its retrospective design and the small number of patients.

### Conclusion

Reduction in cigarette smoking and control of risk factors such as hypertension are important in the prevention of RCC. Renal cell cancer should be diagnosed early because partial nephrectomy can be performed instead of total nephrectomy, especially with small-diameter tumors.

### Ethics

**Ethics Committee Approval:** This study was a retrospective medical record review. For this reason, ethical approval was not received.

**Informed Consent:** Retrospective study.

**Peer-review:** Externally peer-reviewed.

### Authorship Contributions

Surgical and Medical Practices: Ü.Ü., T.T.D., B.Y., N.K., U.Ü.,  
Concept: Ü.Ü., Design: Ü.Ü., T.T.D., Data Collection or  
Processing: T.T.D., B.Y., N.K., Analysis or Interpretation: Ü.Ü.,  
U.Ü., Literature Search: Ü.Ü., T.T.D., U.Ü., Writing: Ü.Ü.

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