Treatment patterns and survival among patients with advanced renal cell cancer: results of a nationwide cohort study in Denmark

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SCOPE



 To characterize treatment patterns and survival outcomes in patients with advanced renal cell cancer (aRCC) in Denmark

CONCLUSIONS



- This observational cohort study describes the characteristics, treatment patterns, and outcomes of an unselected, national cohort of patients with newly diagnosed aRCC in a real-world setting in Denmark, identified from January 2013 to December 2017, with follow-up through December 2018
- These data were derived from linking databases that capture clinical data on cancer and its treatment in routine day-today practice in Denmark
- Systemic anticancer therapy use was limited, with 50% of patients receiving first-line (1L) treatment during follow-up
- Median overall survival (OS) was 35.1 months from diagnosis and 13.6 months for patients with stage IV disease
- The treatment landscape for aRCC continues to evolve, with new agents and immunotherapy combinations being approved following this study period; these front-line therapies may improve outcomes for these patients with poor prognoses
- These data can serve as a useful benchmark for aRCC treatment in an era before the introduction of immunotherapy combinations in routine clinical practice

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BACKGROUND

- Renal cell carcinoma (RCC) is the most common form of kidney cancer. It accounts for approximately 90% of all renal cancers and is the third most common urologic malignancy worldwide^{1,2}
- An estimated 115,174 kidney, renal pelvis, and ureter cancers were diagnosed in Europe in 2012, with approximately 49,000 deaths due to kidney cancer in the same year³
- In Denmark, RCC represents 2%-3% of all cancers, with an average incidence of 825 cases/year for 2011-2015⁴

- Limited studies report real-world evidence representing routine clinical practice in patients with RCC in Europe
- Recent approval of immune checkpoint inhibitor (ICI) and tyrosine kinase inhibitor (TKI) combination therapies has altered the 1L standard of care for patients with aRCC
- This observational study describes patient characteristics, treatment patterns, and survival outcomes in patients with aRCC in Denmark prior to the introduction of immunotherapy-based combination treatments in the 1L setting

METHODS

Study design

- This cohort study used information from Danish population-based medical registries
- Patients with an initial diagnosis of stage III or IV RCC who were registered in the Danish Cancer Registry⁵ from 1 January 2013, to 31 December 2017, were included, with follow-up through 31 December 2018

Data sources

- OS was calculated using the date of all-cause death from the Danish Civil Registration System⁶
- Anticancer treatment was obtained from the Danish National Patient Registry⁷

Ethics

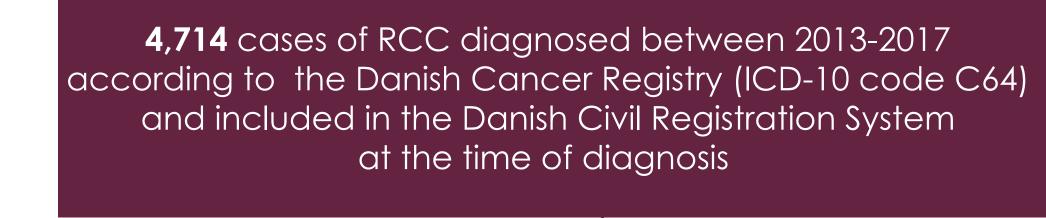
- Under Danish law, ethics committee permission is not required for registry-based research
- This study followed the EU General Data Protection Regulation
- Data were obtained from the Danish Health Data Authority

Statistical analyses

- Summary and descriptive statistics were calculated for categorical and continuous variables as appropriate
- The Kaplan-Meier method was used to estimate median OS
- SAS version 9.4 was used for analyses and R version 4.0.2 for visualizations

RESULTS

Figure 1. Patient attrition



3,154 cases excluded because they did not have stage III or IV disease at the time of diagnosis*

1,560 cases with stage III or IV disease at the time of diagnosis (defined according to AJCC 7th edition)

299 cases excluded because they did not have morphology codes for clear-cell carcinoma

1,261 unique patients with advanced clear-cell RCC at the time of diagnosis

AJCC, American Joint Committee on Cancer; **ICD-10**, International Classification of Diseases, Tenth Revision; **RCC**, renal cell carcinoma.

*The Danish Cancer Registry only captures stage at the date of diagnosis; therefore, it is not possible to include patients progressing to advanced disease after the date of diagnosis.

Patients

- A total of 1,261 patients met inclusion criteria and were included in this analysis (**Figure 1**)
- Median age was 67.1 years (IQR, 59.3-73.7), 723 patients (57.3%) were aged ≥65 years, 850 (67.4%) were men, and 386 (30.6%) had a baseline Charlson Comorbidity Index score ≥3
- Patient characteristics are shown in Table 1
- 525 patients (41.6%) had stage III disease, 649 (51.5%) had stage IV, and 87 (6.9%) had undefined stage III/IV (**Figure 2**)
- Median follow-up was 22.1 months (IQR, 9.6-39.7)

Figure 2. Stage distribution

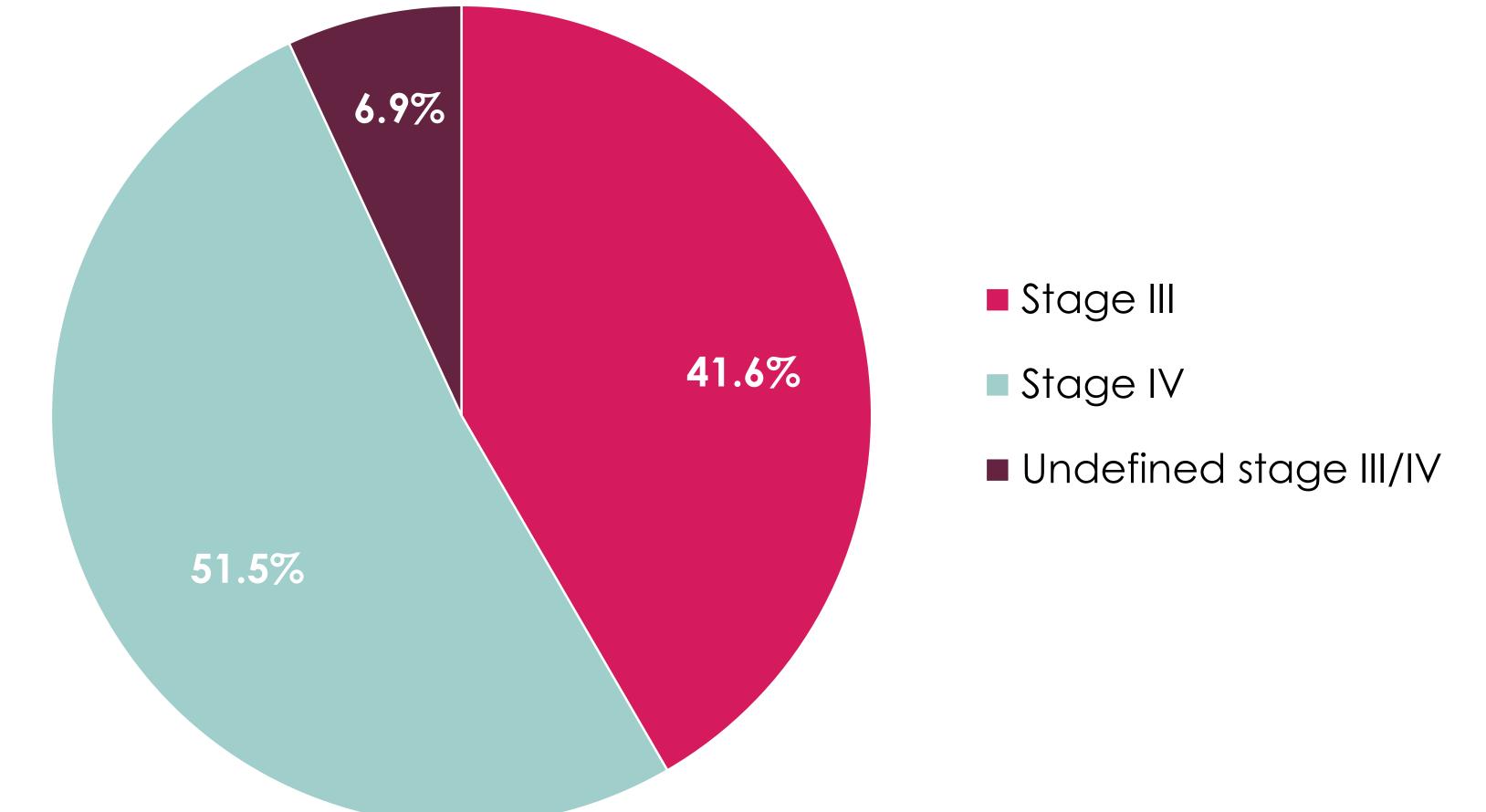


Table 1. Patients diagnosed with incident aRCC 2013-2017 in Denmark

Patient characteristics	N=1,261
Age at diagnosis, years	
Mean (SD)	66.3 (10.1)
Median (Q1-Q3)	67.1 (59.3, 73.7)
Age category, n (%)	
35-49	75 (5.9)
50-64	463 (36.7)
≥65	723 (57.3)
Sex, n (%)	
Male	850 (67.4)
Female	411 (32.6)
Deyo-Charlson Comorbidity Index, n (%)*,9	
0	651 (51.6)
1-2	224 (17.8)
≥3	386 (30.6)
Duration of follow-up from diagnosis, months	
Mean (SD)	26.0 (19.4)
Median (Q1, Q3)	22.1 (9.6, 39.7)

aRCC, advanced renal cell carcinoma

*Included information on diagnoses from 1977 (start date of the Danish National Patient Registry) until and including date of meeting inclusion criteria for the specified cohort (date of cancer diagnosis). Excluded diagnoses of cancer when calculating the Deyo-Charlson Comorbidity Index.8

Treatment patterns

• 848 patients (67.2%) underwent ≥1 therapeutic surgical procedure, 350 (27.8%) received radiation therapy, and 625 (49.6%) initiated systemic anticancer therapy during follow-up

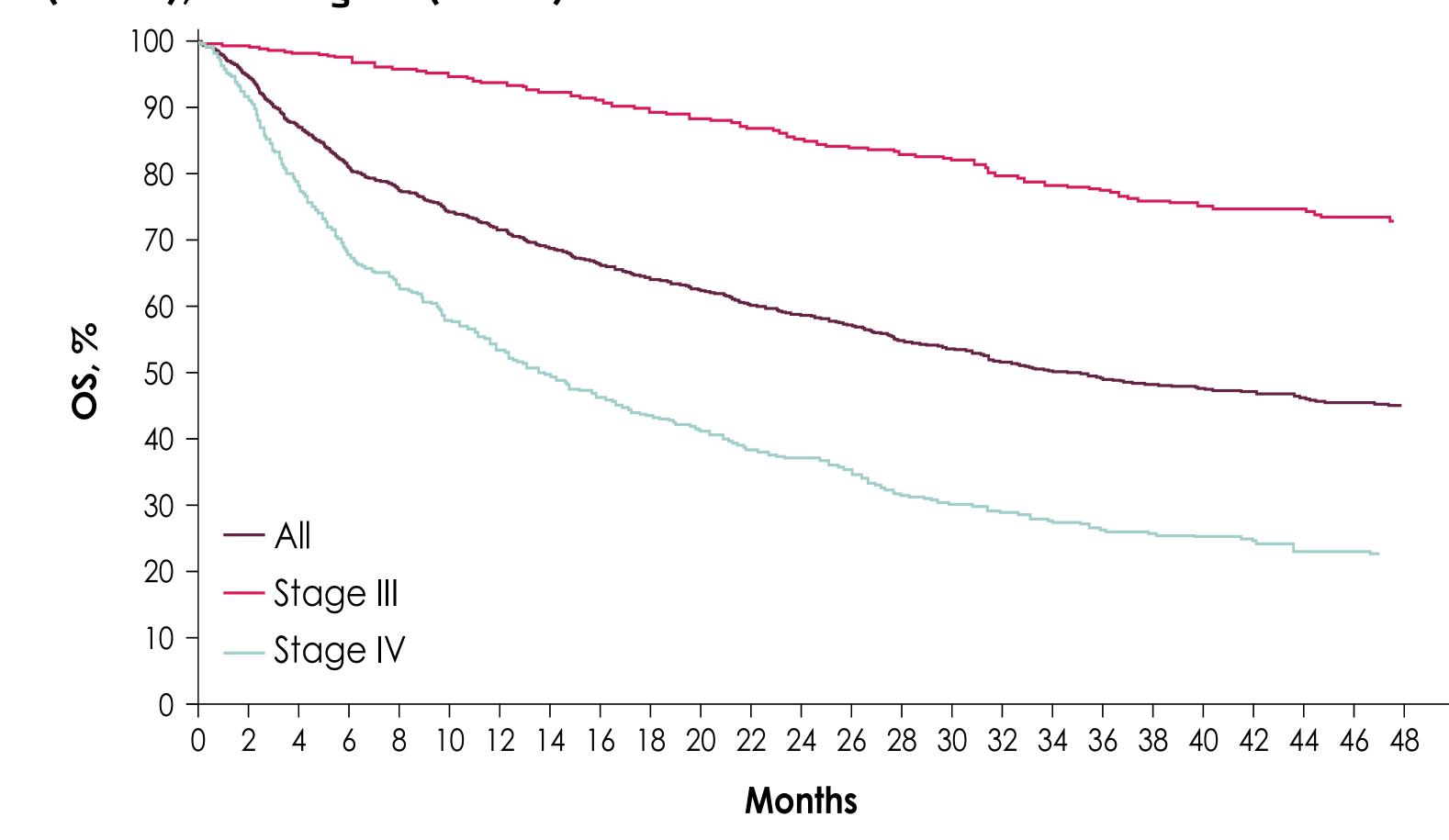
Systemic anticancer therapy

 Of the patients getting any systemic anticancer therapy (n=625), 552 (88.3%) received TKIs at least once, and 90 (14.4%) received PD-1/PD-L1 ICIs at least once

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Median OS from diagnosis was 35.1 months (95% CI, 30.9-42.2) for the overall population but shorter for patients with stage IV disease (13.6 months; 95% CI, 11.8-16.2) (Figure 3)

Figure 3. OS from the date of diagnosis of aRCC for all patients (N=1,261), stage III (n=525), and stage IV (n=649)



aRCC, advanced renal cell carcinoma; OS, overall survival.

Strengths

- This study includes nationwide registries, representing real-world clinical practice in Denmark
- The data represent the full continuum of care with documented and longitudinal tracking of patient information

Limitation

 Limited information was available on disease-specific outcomes, such as cancer recurrence and disease progression

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