Characteristics, treatment patterns, and survival of patients with locally advanced or metastatic renal cell carcinoma in England: results of a nationwide cohort study

EPH281

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CONCLUSIONS

- This study provides insights into patient characteristics, treatment patterns, and outcomes among patients with locally advanced or metastatic renal cell carcinoma (aRCC) in England identified from January 2013 to December 2020 with follow-up until May 2022
- The characteristics of patients with aRCC in this nationwide cohort study were consistent with those of other real-world studies[1]
- Systemic anticancer therapy use was limited, with 36.2% of patients receiving first-line (1L) systemic anticancer therapy and high attrition rates observed across lines of treatment. Approximately half of patients (50.9%) underwent surgical resection
- Overall survival (OS) was 26.5 months (95% CI, 25.5-27.5) from diagnosis and 15.7 months (95% CI, 15.1-16.4) from the initiation of 1L therapy
- The low treatment rates and poor survival outcomes indicate an unmet need within this population
  - Further research is needed to understand the real-world potential of newer combination therapies for the treatment of aRCC

PLAIN LANGUAGE SUMMARY

- The treatment of people with advanced renal cancer has changed in recent years with the approval of new treatment combinations in multiple countries
- In this study, researchers looked at medical records of people receiving treatment for advanced renal cancer in England to determine their characteristics, what type of treatments they received, and how long they lived after treatment
- Of 25,918 people with advanced renal cancer identified using nationwide health records in England, only 8,443 (36.2%) received systemic drug treatment
  - Of all people diagnosed with advanced renal cancer, more than 50% were alive 24 months after diagnosis
  - Of people who received systemic drug treatment, approximately 40% were alive 24 months after starting systemic drug treatment
- Our findings suggest that a low proportion of people with advanced renal cancer received systemic drug treatment in England
- More studies are needed to explore the effect of newer treatment combinations for advanced renal cancer

BACKGROUND

- The 1L treatment landscape for aRCC has been revolutionized in recent years with the approval of multiple immuno-oncology (IO) and tyrosine kinase inhibitor (TKI) combination regimens
  - These include pembrolizumab with axitinib (US Food and Drug Administration [FDA] and European Medicines Agency [EMA] in 2019), avelumab + axitinib (FDA and EMA in 2019), and lenvatinib + pembrolizumab (FDA and EMA in 2021)[2]
- Although these combination regimens have demonstrated greater efficacy than TKI monotherapy in clinical trials, little is known about the clinical management of disease in real-world settings
- This study therefore set out to describe the characteristics, treatment patterns, and survival outcomes of patients with newly diagnosed aRCC in England

METHODS

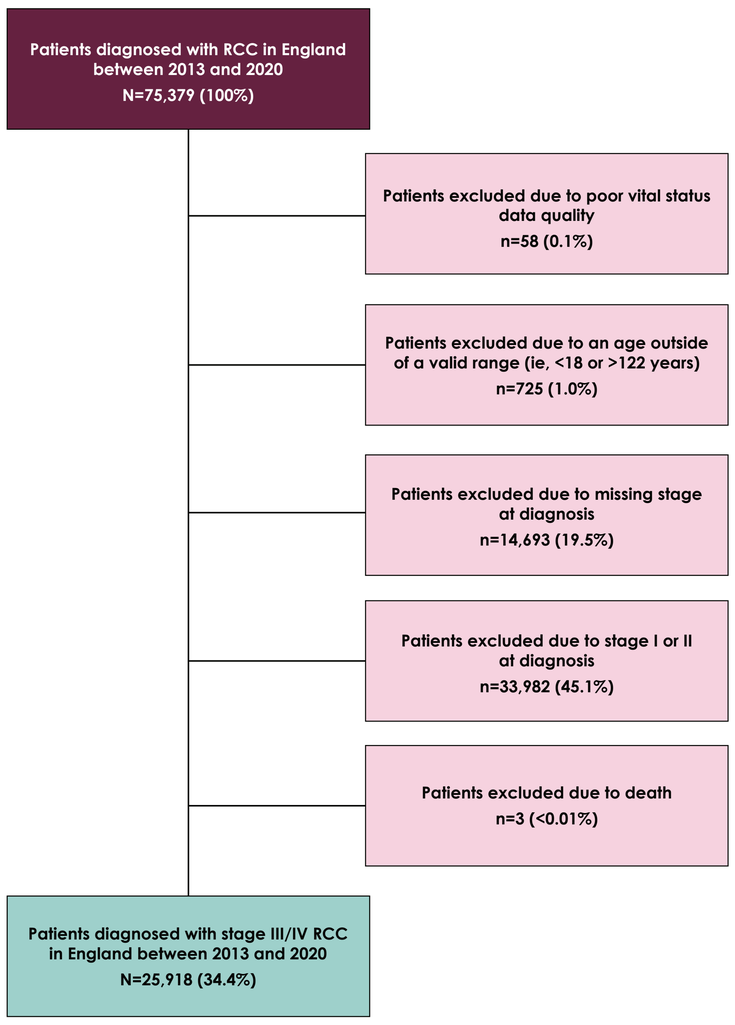
- The cohort was identified using routine administrative data managed by the National Disease Registration Service. Patient-level linkage was used to extract national data
  - Cancer diagnoses and deaths (National Cancer Registration Dataset)[3]
  - Inpatient admissions, outpatient appointments, and comorbid diagnoses (Hospital Episode Statistics)[4]
  - Anticancer radiotherapy (National Radiotherapy Dataset)[5]
  - Systemic anticancer treatments (Systemic Anti-Cancer Therapy Dataset [SACT])[6]
- Adult patients were included following an incident primary diagnosis (index date) of stage III/IV RCC between January 2013 and December 2020. Patient follow-up occurred from the index date to the first of death, loss to follow-up, or end of the study (May 2022)
- Comorbidities were considered during a baseline period between 3 and 27 months prior to diagnosis. A modified Deyo-Charlson score was calculated for each patient based on evidence of 17 prespecified medical conditions within the baseline period. These included but were not limited to myocardial infarction, dementia, and liver disease
- OS was calculated using the Kaplan-Meier method

RESULTS

Patient demographics and tumor characteristics

- Among 25,918 patients who were included in the cohort (**Figure 1**), the mean age was 68.1 years (SD, 12.3), 66% were male, and 84.1% had a tumor with a clear cell histology (**Table 1**)
- The mean modified Deyo-Charlson Comorbidity Index at baseline was 2.8 (SD, 1.7), with hypertension being the most common comorbidity (20.0%)
- The median duration of patient follow-up was 21.8 months

Figure 1. Cohort inclusion criteria



RCC, renal cell carcinoma.

RESULTS (CONTD)

Table 1. Baseline characteristics of patients with incident aRCC

	N= 25,918
Immunocompromised at baseline, n (%)*	548 (2.1)
Morphology, n (%)	
Clear cell renal carcinoma	21,807 (84.1)
Unknown morphology	2,610 (10.1)
Age at diagnosis, years	
Mean (SD)	68.1 (12.3)
Median (IQR)	69.0 (60.0-77.0)
Sex, n (%)	
Female	8,804 (34.0)
Male	17,114 (66.0)
English Index of Multiple Deprivation 2015, income component, n (%)	
Quintile 1 (least deprived)	5,081 (19.6)
Quintile 2	5,787 (22.3)
Quintile 3	5,441 (21.0)
Quintile 4	4,892 (18.9)
Quintile 5 (most deprived)	4,717 (18.2)
Year of diagnosis, n (%)	
2013	2,860 (11.0)
2014	3,290 (12.7)
2015	3,394 (13.1)
2016	3,459 (13.3)
2017	3,339 (12.9)
2018	3,442 (13.3)
2019	3,100 (12.0)
2020	3,034 (11.7)
ECOG performance status at diagnosis, n (%)	
0	4,090 (15.8)
1	2,426 (9.4)
2	984 (3.8)
3	582 (2.2)
4	134 (0.5)
Not recorded	17,702 (68.3)
Duration of follow-up from diagnosis, months	
Mean (SD)	31.2 (30.0)
Median (IQR)	21.8 (4.8-50.4)
Modified Deyo-Charlson Comorbidity Index score at baseline	
Mean (SD)	2.8 (1.7)
Median (IQR)	3.0 (2.0-4.0)

aRCC, advanced renal cell carcinoma; **ECOG,** Eastern Cooperative Oncology Group; IQR, interquartile range. *Patients are considered immunocompromised if they have a history of HIV, AIDS, multiple myeloma, chronic lymphocytic leukemia, or hypogammaglobulinemia or have received an organ transplant (including allogeneic stem cell transplant). Diagnoses and procedures are captured from the cancer registry and the Hospital Episode Statistics inpatient and outpatient tables. The baseline period for this indicator is defined as the period between 6 years and 1 day prior to diagnosis.

Treatment patterns

- **Table 2** provides information regarding cancer treatments received by patients. During follow-up, 50.9% of patients underwent ≥1 surgical resection and 22.6% received radiation therapy
- Only 8,443 patients (36.2%) received 1L systemic treatment; of these, 4,160 (49.3%) received second-line treatment, 1,873 (21.8%) received third-line treatment, and 743 (8.8%) received fourth-line or later treatment
- Among patients receiving 1L systemic treatment, 82.4% of patients were treated with ≥1 targeted therapy and 17.0% with ≥1 IO treatment in 1L

Table 2. Anticancer treatments received during follow-up

	N=25,918
≥1 resection during the primary course of treatment, n (%)	13,184 (50.9)
Receipt of radiation therapy, as documented in RTDS, n (%)	5,862 (22.6)
Total duration of radiation therapy, days	
Mean (SD)	133.6 (311.0)
Median (IQR)	6.0 (1.0-95.1)
Receipt of systemic therapy, as documented in SACT, n (%)	8,443 (32.6)
No. of administrations	
Mean (SD)	16.6 (20.0)
Median (IQR)	10.0 (3.0-23.0)
No. of treatment lines observed, n (%)	
First line	8,443 (100.0)
Second line	4,160 (49.3)
Third line	1,837 (21.8)
Fourth line	743 (8.8)
Receipt of 1L drug from the following classes, n (%)	8,443 (100)
Antimetabolites	264 (3.1)
Platinum compounds	290 (3.4)
Other cytotoxic agents	74 (0.9)
Targeted therapies	6,958 (82.4)
Immune checkpoint inhibitors	1,432 (17.0)
Taxanes	41 (0.5)

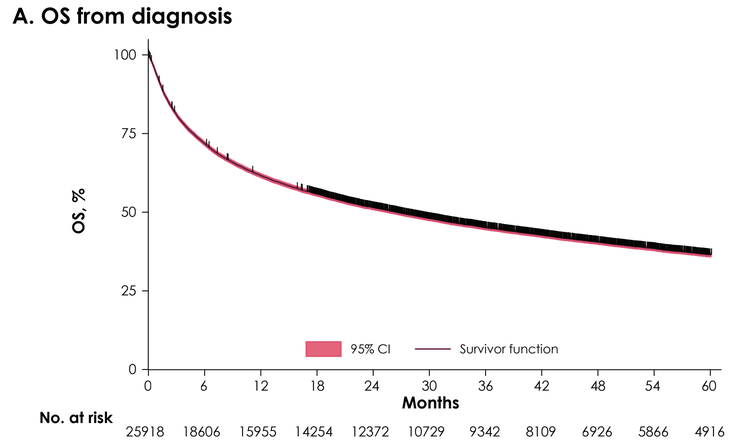
IQR, interquartile range; **RTDS,** National Radiotherapy Dataset; **SACT,** Systemic Anti-Cancer Therapy Dataset.

OS

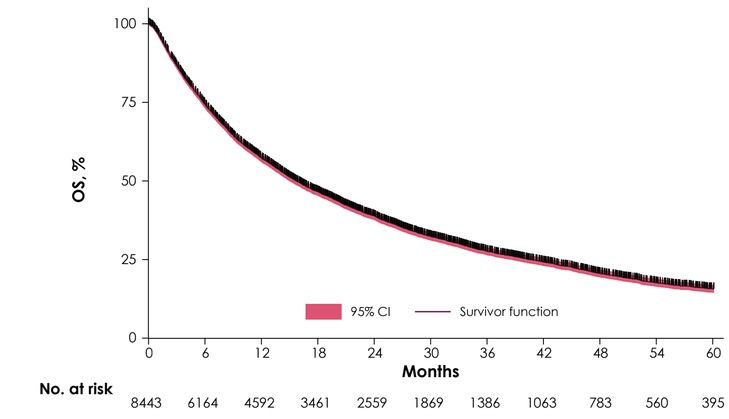
- Of 25,918 patients, 62.7% died during the study. The median OS from diagnosis was 26.5 months (95% CI, 25.5-27.5) and the 24-month survival estimate was 51.5% (95% CI, 50.8%-52.1%) (**Figure 2A**)
- For the 8,443 patients who received treatment with systemic therapy, median OS from the initiation of 1L treatment was 15.7 months (95% CI, 15.1-16.4) and the 24-month survival estimate was 39.0% (95% CI, 38.0%-40.0%) (**Figure 2B**)

Figure 2. OS from time of diagnosis and from treatment initiation

A. OS from diagnosis



B. OS from treatment initiation



OS, overall survival.

STRENGTHS AND LIMITATIONS

Strengths

- Data from a national cancer registry in England, with linkage to other relevant datasets
  - Real-world data relating to the epidemiology and outcomes of patients with incident advanced or metastatic RCC
  - Comprehensive data, with records for every patient with a diagnosis or treatment for aRCC provided or funded by the National Health Service (NHS)
- The cancer registry benefits from mandatory data submission and robust validation procedures, maximizing completeness as well as standardizing recording to reduce the risk of misclassification
- Documentation of the full continuum of care in all NHS-funded settings and longitudinal tracking of patient information

Limitations

- The cancer registry and its linked datasets lack information on health outcomes such as cancer recurrence and disease progression
- The low completeness of tumor staging or histology (17% missing stage)
- The SACT dataset only contains systemic therapy data prescribed to cancer patients by secondary and tertiary care providers in the NHS
- Drugs funded through the Cancer Drugs Fund are not included
- Lines of systemic therapy were derived using an algorithm
- The incompleteness of data items such as *International Classification of Disease 10th edition* diagnosis codes and OPCS Classification of Interventions and Procedures version 4 procedure codes in Hospital Episode Statistics

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REFERENCES 1. McGrane J, et al. Cancer Med. 2024;13(12):e7327. **2.** Castro DV, et al. JACC CardioOncol. 2022;4(2):271-5. **3.** Henson KE, et al. Int J Epidemiol. 2020;49(1):16-16h. **4.** Herbert A, et al. Int J Epidemiol. 2017;46(4):1093-1093i. **5.** Sandhu S, et al. BMJ Open. 2023;13(6):e070699. **6.** Bright CJ, et al. Int J Epidemiol. 2020;49(1):15-15l. **DISCLOSURES S. H. Mahmoudpour** reports employment by Merck. **C. Knott** reports employment by Health Data Insight CIC and NHS England. **M. Kearney** reports employment by Merck and stock and other ownership interests in Merck, Novartis, and UCB. **E. Boutmy** reports employment by and owns stock from Merck. **ACKNOWLEDGMENTS** This study was sponsored by Merck (CrossRef Funder ID: 10.13039/100009945). Editorial support was provided by Nucleus Global and was funded by Merck. This work uses data that has been provided by patients and collected by the NHS as part of their care and support. The data are collated, maintained, and quality assured by the National Disease Registration Service, which is part of NHS England.

Poster No. EPH281. Presented at ISPOR Europe, 17-20 November 2024; Barcelona, Spain.