Real-world treatment patterns and outcomes in patients with extensive-stage small cell lung cancer treated with first-line platinum-based chemotherapy and ≥2 subsequent lines of therapy in the United States

RWD155

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OBJECTIVES

- To describe patient characteristics, treatment patterns, and outcomes among a real-world cohort of patients with extensive-stage small cell lung cancer (ES-SCLC) who received first-line (1L) platinum-based chemotherapy (PBC), using an electronic health record (EHR)–derived dataset from Flatiron Health
- The primary objectives of this study were to describe demographic and clinical characteristics among patients receiving third-line (3L) treatment (ie, those who received ≥2 subsequent lines of therapy [LOTs] after 1L PBC), and treatment patterns and sequencing at the start of each index LOT (1L–3L)
- Secondary objectives were to describe real-world overall survival (rwOS), real-world time to treatment discontinuation or death (rwTTD/D), real-world time to next treatment or death (rwTTNT/D), and real-world objective response rate (rwORR) among the 3L cohort

CONCLUSIONS

- This retrospective analysis of real-world patient data from a large nationwide multi-institutional database demonstrated no clear SOC for patients with ES-SCLC receiving 3L therapy
- This study demonstrated the substantial attrition across LOTs for patients with ES-SCLC treated with 1L PBC, with only 38.6% and 13.4% going on to receive 2L and 3L therapy, respectively
- Treatment duration was short, and outcomes, including rwOS and rwORR, were poor, highlighting the substantial unmet need for novel treatment options in this setting
- Outcomes were similarly poor across the overall population of patients receiving 3L treatment and the 3 subgroups of interest, indicating that the need for effective 3L therapies for patients with ES-SCLC remains regardless of treatments received in earlier lines
- The treatment landscape for ES-SCLC is evolving rapidly, and as such, data for treatments approved after June 2023 are not captured in this study

INTRODUCTION

- Median OS among patients with ES-SCLC following SOC 1L PBC is ~10 months,[1,2] and disease recurrence is common[3]
- Treatment options beyond 1L are limited; until recently, only lurbinectedin and topotecan were approved for use in the 2L setting in the US,[4,5] offering median OS of only 9.3 months and 7.8 months, respectively, in populations of patients with SCLC[6,7]
- Understanding patient characteristics, treatment patterns, and outcomes in this setting may inform clinical development of novel therapies for ES-SCLC
- A retrospective analysis of real-world data from a US cohort of patients with ES-SCLC who received 1L PBC and ≥2 subsequent LOTs is presented here

METHODS

- This study used data from the US nationwide Flatiron Health EHR-derived de-identified database, a longitudinal database comprising patient-level structured and unstructured data, curated via technology-enabled abstraction[8,9]
- During the study period (January 1, 2018–December 31, 2023), the data originated from ~280 US cancer clinics (~800 sites of care)
- Patients ≥18 years of age with a diagnosis of ES-SCLC and ≥2 clinical visits recorded in the database during the patient identification period (January 1, 2018–June 30, 2023), and who received 1L PBC (any treatment regimen containing carboplatin or cisplatin) on or before June 30, 2023, were included in the overall population (the "1L cohort")
  - Patients included in the 2L or 3L cohort must have received their index treatment on or before June 30, 2023
- Patients were excluded if they received clinical trial study drugs (as defined by the Flatiron LOT algorithm) or oxaliplatin in any LOT during the study period
- Patients in the 1L cohort who received ≥2 subsequent LOTs were included in the "3L cohort"; additional analyses were performed in 3 subgroups of the 3L cohort (individual patients could have been included in ≥1 subgroup):
  - Patients who received any 1L regimen containing nivolumab, pembrolizumab, cemiplimab, durvalumab, or atezolizumab were included in the "1L anti–PD-(L)1" subgroup
  - Patients with ECOG PS of 0 or 1 at 3L index (defined as the date on which patients initiated 3L therapy) were included in the "ECOG PS 0–1" subgroup
  - Patients treated with 2L PBC were included in the "PBC rechallenge" subgroup
- rwORR in the 3L cohort was assessed in patients with ≥2 real-world response assessments after 3L index that were ≥28 days apart
- rwOS, rwTTD/D, and rwTTNT/D were estimated from 3L index using Kaplan–Meier methodology
- rwORR was calculated using all real-world response assessments from 3L index until the earliest occurrence of real-world progressive disease, initiation of a subsequent LOT, or end of follow-up

RESULTS

- A total of 2573 patients met the criteria for inclusion in the 1L cohort
- Among patients in the 1L cohort, 992 (38.6%) received ≥1 subsequent LOT and were included in the 2L treatment patterns analysis cohort, and 344 (13.4%) received ≥2 subsequent LOTs and were included in the 3L cohort
- Among patients in the 3L cohort, 191 (55.5%), 225 (65.4%), and 125 (36.3%) were included in the 1L anti–PD-(L)1, ECOG PS 0–1, and PBC rechallenge subgroups, respectively
- A total of 77 patients in the 3L cohort were included in analyses of rwORR
- In the 3L cohort, the median age was 66.5 years, approximately half of patients were male (51.5%), 65.4% had ECOG PS 0–1, and most patients received care in a community setting (75.3%); nearly all patients were current or past smokers (96.5%; **Table 1**)
- Baseline characteristics in the 1L cohort were generally comparable with those of the 3L cohort
- Patient characteristics in the overall 3L cohort were similar to those observed in the 1L anti–PD-(L)1, ECOG PS 0–1, and PBC rechallenge subgroups, and in the response-evaluable population (data not shown)

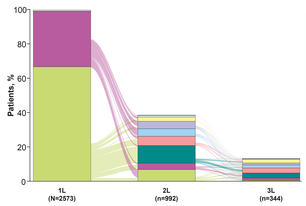
Table 1. Baseline demographics and clinical characteristics[a]

	1L cohort (N=2573)	3L cohort (n=344)
Age at index, years		
Median (range)	68.0 (30.0–85.0)	66.5 (40.0–85.0)
<65, n (%)	902 (35.1)	144 (41.9)
65–74, n (%)	983 (38.2)	137 (39.8)
≥75, n (%)	688 (26.7)	63 (18.3)
Sex, n (%)		
Male	1273 (49.5)	177 (51.5)
Female	1300 (50.5)	167 (48.5)
Race, n (%)		
Asian	26 (1.0)	3 (0.9)
Black	179 (7.0)	19 (5.5)
White	1826 (71.0)	260 (75.6)
Other or unknown	542 (21.1)	62 (18.0)
ECOG PS at index, n (%)		
0–1	1451 (56.4)	225 (65.4)
≥2	674 (26.2)	85 (24.7)
Unknown	448 (17.4)	34 (9.9)
Smoking status, n (%)		
Current or past smoker	2526 (98.2)	332 (96.5)
Never smoker	45 (1.7)	12 (3.5)
Missing	2 (0.1)	0
Care setting, n (%)		
Academic	466 (18.1)	71 (20.6)
Community	2043 (79.4)	259 (75.3)
Both	64 (2.5)	14 (4.1)
Chemotherapy-free interval,[b] n (%)		
<90 days	–	149 (43.3)
≥90 to <180 days	–	115 (33.4)
≥180 days	–	80 (23.3)

[a]The baseline period was defined as the date of the first activity 30 days prior to the index treatment date. [b]Defined as the time interval from the end of 1L PBC to the start of any 2L therapy.

- The treatment patterns analysis revealed that there was no clear SOC in the 2L and 3L settings (**Figure 1**)
- The majority of patients (n=2548 [99.0%]) received PBC + topoisomerase inhibitor ± anti–PD-(L)1 as 1L therapy
- Lurbinectedin-containing regimens (monotherapy or combinations) were the most common treatment in the 2L setting but were only received by 263 (26.5%) patients
  - In total, 291 (29.3%) patients received PBC in this setting, most frequently in combination with a topoisomerase inhibitor ± anti–PD-(L)1
- In the 3L setting, the most common treatments were lurbinectedin-containing regimens (monotherapy or combinations) and topoisomerase inhibitors, each received by 75 (21.8%) patients
  - Additional 3L treatments received by >10% of patients were chemotherapy "other" (n=54 [15.7%]), anti–PD-(L)1 monotherapy (n=45 [13.1%]), and PBC + topoisomerase inhibitor (n=35 [10.2%])

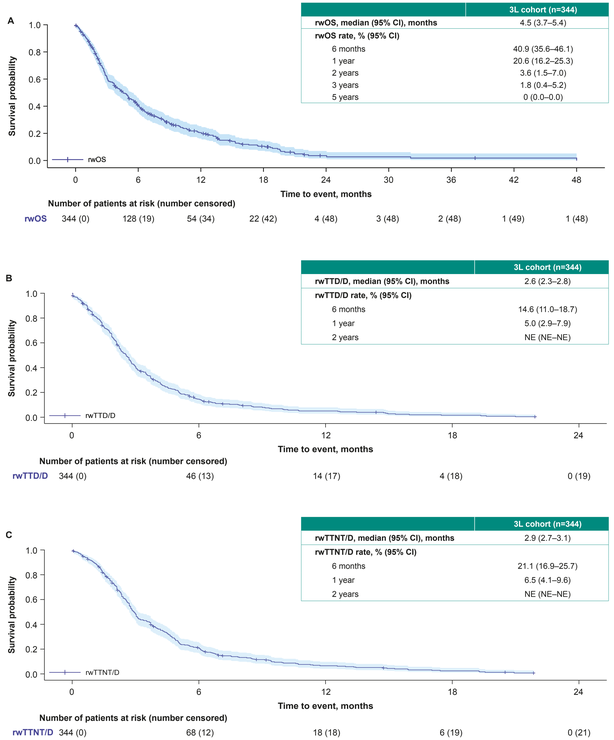
Figure 1. Treatment patterns and sequencing



Treatment category[a]	1L (N=2573)	2L (n=992)	3L (n=344)
PBC + anti–PD-(L)1 + topoisomerase inhibitor	1711 (66.5)	176 (17.7)	14 (4.1)
PBC + topoisomerase inhibitor	837 (32.5)	96 (9.7)	35 (10.2)
PBC "other"[b]	23 (0.9)	19 (1.9)	10 (2.9)
Anti–PD-(L)1 "other"[c]	2 (0.1)[d]	110 (11.1)	30 (8.7)
Any lurbinectedin-containing regimen	0	263 (26.5)	75 (21.8)
Topoisomerase inhibitor(s) only	0	139 (14.0)	75 (21.8)
Anti–PD-(L)1 monotherapy	0	114 (11.5)	45 (13.1)
Chemotherapy "other"[e]	0	63 (6.4)	54 (15.7)
Other	0	12 (1.2)	6 (1.7)

[a]Categories are ordered based on frequency of use in 1L, then by frequency of use in 2L. [b]Cisplatin or carboplatin monotherapy, or other PBC regimens that would not meet criteria for inclusion in other treatment categories. [c]Nivolumab, pembrolizumab, cemiplimab, durvalumab, or atezolizumab in combination with any other agent, excluding regimens that would meet criteria for inclusion in other treatment categories. [d]Patients received anti–PD-(L)1 + PBC without topoisomerase inhibitors. [e]Included paclitaxel, docetaxel (2L only), paclitaxel protein-bound (3L only), gemcitabine, temozolomide, and any other chemotherapy regimens that would not meet criteria for inclusion in other treatment categories.

Figure 2. Real-world (A) OS, (B) TTD/D, and (C) TTNT/D among patients receiving 3L therapy



A	3L cohort (n=344)
rwOS, median (95% CI), months	4.5 (3.7–5.4)
rwOS rate, % (95% CI)	
6 months	40.9 (35.6–46.1)
1 year	20.6 (16.2–25.3)
2 years	3.6 (1.5–7.0)
3 years	1.8 (0.4–5.2)
5 years	0 (0.0–0.0)

B	3L cohort (n=344)
rwTTD/D, median (95% CI), months	2.6 (2.3–2.8)
rwTTD/D rate, % (95% CI)	
6 months	14.6 (11.0–18.7)
1 year	5.0 (2.9–7.9)
2 years	NE (NE–NE)

C	3L cohort (n=344)
rwTTNT/D, median (95% CI), months	2.9 (2.7–3.1)
rwTTNT/D rate, % (95% CI)	
6 months	21.1 (16.9–25.7)
1 year	6.5 (4.1–9.6)
2 years	NE (NE–NE)

- Median rwOS from 3L index was 4.5 months (95% CI, 3.7–5.4; **Figure 2A**)
  - From 3L index, the 6-month rwOS rate was 40.9% (95% CI, 35.6–46.1); at 1 year and 2 years the rwOS rate reduced to 20.6% (95% CI, 16.2–25.3) and 3.6% (95% CI, 1.5–7.0), respectively
- Median rwTTD/D and rwTTNT/D from 3L index were 2.6 months (95% CI, 2.3–2.8; **Figure 2B**) and 2.9 months (95% CI, 2.7–3.1; **Figure 2C**), respectively
- Among the 77 patients in the 3L cohort evaluable for response, rwORR was 11.7% (95% CI, 5.5–21.0)
- Outcomes from 3L index remained poor between the ECOG PS 0–1, anti–PD-(L)1, and PBC rechallenge subgroups (**Table 2**)
  - However, median rwOS was numerically longer in the PBC rechallenge subgroup than in the other subgroups and the overall 3L cohort
  - Across all 3L cohort subgroups (unadjusted for varying patient characteristics) and the overall 3L cohort, median rwTTNT/D was ≤3.5 months and ≥47.2% of patients died before initiating 4L therapy

Table 2. Real-world outcomes in the overall 3L cohort and 3L cohort subgroups

	3L cohort subgroups			
	1L anti–PD-(L)1 (n=191)	ECOG PS 0–1 (n=255)	PBC rechallenge (n=125)	Overall 3L cohort (n=344)
rwOS, median (95% CI), months	4.9 (3.2–5.9)	5.9 (4.9–6.4)	6.8 (4.5–8.0)	4.5 (3.7–5.4)
rwTTD/D, median (95% CI), months	2.6 (2.3–3.0)	2.8 (2.4–3.1)	2.8 (2.3–3.4)	2.6 (2.3–2.8)
rwTTNT/D, median (95% CI), months	3.0 (2.7–3.7)	3.2 (2.9–3.8)	3.5 (2.8–4.0)	2.9 (2.7–3.1)
Patients started 4L therapy, n (%)	67 (35.1)	92 (40.9)	55 (44.0)	123 (35.8)
Patients died before initiating 4L therapy, n (%)	112 (58.6)	117 (52.0)	59 (47.2)	200 (58.1)

REFERENCES

1. Paz-Ares L, et al. *ESMO Open*. 2022;7:100408.
2. Liu SV, et al. *J Clin Oncol*. 2021;39:619–630.
3. Rudin CM, et al. *Nat Rev Dis Primers*. 2021;7:3.
4. ZEPZELCA® (lurbinectedin) [prescribing information]. Available at: https://pp.jazzpharma.com/pi/zepzelca.en.USPI.pdf. Revised 2025.
5. Topotecan [prescribing information]. Available at: https://www.accessdata.fda.gov/drugsatfda_docs/label/2011/200582s000lbl.pdf. Revised 2011.
6. Trigo J, et al. *Lancet Oncol*. 2020;21:645–654.
7. von Pawel J, et al. *J Clin Oncol*. 2014;32:4012–4019.
8. Birnbaum B, et al. Model-assisted cohort selection with bias analysis for generating large-scale cohorts from the EHR for oncology research. *arXiv*. Preprint posted online January 13, 2020. https://doi.org/10.48550/arXiv.2001.09765. Accessed April 8, 2025.
9. Ma X, et al. Comparison of population characteristics in real-world clinical oncology databases in the US: Flatiron Health, SEER, and NPCR. *medRxiv*. Preprint posted online June 7, 2023. https://doi.org/10.1101/2020.03.16.20037143. Accessed April 8, 2025.

ABBREVIATIONS

1L, first-line; **2L**, second-line; **3L**, third-line; **4L**, fourth-line; **CI**, confidence interval; **ECOG PS**, Eastern Cooperative Oncology Group performance status; **EHR**, electronic health record; **(ES-)SCLC**, (extensive-stage) small cell lung cancer; **LOT**, line of therapy; **NE**, not evaluable; **PBC**, platinum-based chemotherapy; **PD-(L)1**, programmed death (ligand) 1; **rwORR**, real-world objective response rate; **(rw)OS**, (real-world) overall survival; **rwTTD/D**, real-world time to treatment discontinuation or death; **rwTTNT/D**, real-world time to next treatment or death; **SOC**, standard-of-care; **US**, United States.

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DISCLOSURES

Sudhir Unni is an employee of Daiichi Sankyo, Inc.

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