REAL-WORLD BURDEN OF MYELOSUPPRESSION AMONG PATIENTS WITH EXTENSIVE-STAGE SMALL CELL LUNG CANCER TREATED IN THE COMMUNITY ONCOLOGY SETTING

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INTRODUCTION

- Myelosuppression is a major dose-limiting toxicity of chemotherapy for extensive-stage small cell lung cancer (ES-SCLC).[1] Myelosuppression causes a reduction in bone marrow activity, resulting in the reduced production of white blood cells, red blood cells, and/or platelets[2,3]
- Management of myelosuppression often requires the administration of rescue interventions such as growth factors and blood or platelet transfusions, as well as chemotherapy dose delays and reductions[2–4]
- Neutropenia, anemia, and thrombocytopenia are complications borne by these patients and the health care system[1]

OBJECTIVE

- To describe the prevalence and frequency of myelosuppression, treatment patterns, and supportive care utilization among patients with ES-SCLC treated with chemotherapy in the US community oncology setting

METHODS

Data Source

- This retrospective observational study used structured data from The US Oncology Network's iKnowMed (iKM) electronic health record system
- Data were supplemented by vital status from the Social Security Administration's Limited Access Death Master File, and health care resource utilization data from the Financial Data Warehouse

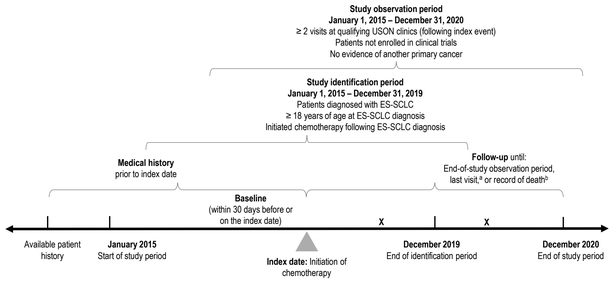
Study Population

- Adult patients with ES-SCLC who initiated chemotherapy between January 1, 2015, and December 31, 2019, were identified. Date of chemotherapy initiation was considered the index date (**Figure 1**)
  - Chemotherapy initiation was defined as the first course of chemotherapy initiated after diagnosis of ES-SCLC; patients must have had no evidence of receiving any chemotherapy within the 12 months prior to diagnosis
  - Patients were followed from index date through December 31, 2020, the date of last visit, or date of death, whichever occurred first
- Patients enrolled in clinical trials or diagnosed with other primary tumors during the study period were excluded

Outcome and Analysis

- Myelosuppressive events were identified using iKM for laboratory values based on the Common Terminology Criteria for Adverse Events version 5.0 definitions for anemia, neutropenia, and thrombocytopenia[5]
- Prevalence and frequency of myelosuppression (by type and grade), treatment patterns, and supportive care utilization (granulocyte colony-stimulating factor [G-CSF], erythropoiesis-stimulating agents, intravenous [IV] hydration) during the follow-up period were reported

Figure 1. Study Design Overview



[a] Last visit = last physical encounter.
[b] Whichever occurred first.
X = Additional visit at qualifying USON clinic or record of death.
ES-SCLC, extensive-stage small cell lung cancer; USON, US Oncology Network.

RESULTS

Demographic and Clinical Characteristics

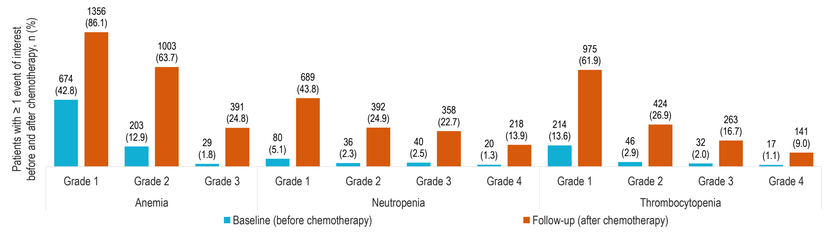
- The study population included 1574 patients. Baseline demographic and clinical characteristics are described in **Table 1**
- Most patients were White (82.2%), and Medicare was the primary payer (47.5%)
- At baseline, the mean hemoglobin reported represented grade 1 anemia, whereas both mean absolute neutrophil count and mean platelet count fell within normal range (**Table 1**)
- Patients started chemotherapy soon after ES-SCLC diagnosis (time from ES-SCLC diagnosis to index date: mean 0.9 months; median 0.4 months)

Table 1. Demographic and Clinical Characteristics at Baseline

Baseline Characteristics	N = 1574
Age, mean (SD), years	68 (9.1)
< 65	611 (38.8)
≥ 65	963 (61.2)
Male sex, n (%)	750 (47.6)
ECOG PS, n (%)	
0	113 (7.2)
1	761 (48.3)
2	331 (21.0)
≥ 3	36 (2.3)
Not documented	333 (21.2)
Count of metastatic site(s) at index, n (%)	
1	474 (30.1)
2	253 (16.1)
3	138 (8.8)
4+	83 (5.3)
Not documented	626 (39.8)
Index LOT, n (%)	
LOT 1	1566 (99.5)
LOT 2	8 (0.5)
Hemoglobin at baseline, mean (SD), g/dL	12.3 (1.9)
Absolute neutrophil count at baseline, mean (SD), 1000/μL	6.8 (3.5)
Platelet count at baseline, mean (SD), 1000/μL	275.0 (108.9)
Time from ES-SCLC diagnosis to index, mean (SD), months	0.9 (4.3)

ECOG PS, Eastern Cooperative Oncology Group performance status; ES-SCLC, extensive-stage small cell lung cancer; LOT, line of therapy.

Figure 2. Myelosuppressive Events Before and After Chemotherapy



Myelosuppressive Events

- During follow-up (mean 8.9 months), 24.8% of patients experienced grade ≥ 3 anemia; 22.7% and 13.9% experienced grade 3 and grade 4 neutropenia, respectively; and 16.7% and 9.0% experienced grade 3 and grade 4 thrombocytopenia, respectively (**Figure 2**)
  - Prior to chemotherapy initiation, prevalence of myelosuppressive events was low, suggesting that these events resulted from chemotherapy-induced myelosuppression (**Figure 2**)
- 778 (49.4%) patients had ≥ 1 grade 3 or higher myelosuppressive event in any lineage, 454 (28.8%) had ≥ 1 grade 3 or higher myelosuppressive event in ≥ 2 lineages, and 95 (6.0%) had ≥ 1 grade 3 or higher myelosuppressive event in all 3 lineages (**Figure 3**)
  - The mean numbers of events during follow-up were 2.1, 1.9, and 2.4 for patients who experienced grade ≥ 3 anemia, grade ≥ 3 neutropenia, and grade ≥ 3 thrombocytopenia, respectively

Treatment Patterns

- Close to one-third (30.9%) of patients received < 4 chemotherapy cycles of the index treatment (**Table 2**)
- Almost 10% of the population had a treatment hold (defined as gap in treatment > 60 days; **Table 2**)
- Most patients (84.5%) had a treatment delay of 14–60 days (**Table 2**) and 586 (38.1%) had a dose decrease
- 95.2% of patients received a platinum/etoposide-containing regimen (81.4% without immuno-oncology combination therapy, 13.8% in combination with immuno-oncology) as the index regimen (**Figure 4**)
  - Following chemotherapy index treatment, more than half (58.8%) of patients did not receive any further treatment

Supportive Care Utilization for AE Management

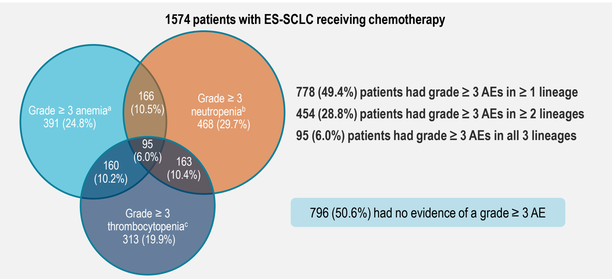
- More than half (59.0%) of patients received IV hydration and 21.3% of patients were eligible for red blood cell transfusion (**Table 2**)
- 71.5% of patients received a G-CSF after chemotherapy initiation (**Table 2**)
  - 43.9% received a G-CSF within 1–3 days after chemotherapy initiation, and 27.6% received a G-CSF ≥ 4 days after chemotherapy initiation
  - Approximately two-thirds of patients received pegfilgrastim (65.4%) or its biosimilars (1.2%)
- More than 10% of patients received an ESA after chemotherapy initiation (**Table 2**)

Table 2. Treatment Outcomes During Follow-up

Outcomes During Follow-up	N = 1574
Follow-up duration from index date, mean (SD), months	8.9 (8.5)
Reason for end of follow-up, n (%)	
Death	986 (62.6)
Last activity date on or before study end date	588 (37.4)
Chemotherapy cycles, n (%)	
1	198 (12.6)
2	161 (10.2)
3	127 (8.1)
4	467 (29.7)
5	103 (6.5)
6	376 (23.9)
> 6	133 (8.4)
Not documented	9 (0.6)
Index treatment hold, n (%)[a]	142 (9.2)
Index treatment delays, n (%)[a]	
14–60 days	1298 (84.5)
14–30 days	1276 (83.0)
31–60 days	283 (18.5)
Dose decrease of index treatment, n (%)[a]	586 (38.1)
IV hydration use – yes, n (%)	928 (59.0)
Patients who met transfusion criteria, n (%)	
RBC transfusions (hemoglobin < 8 g/dL)	335 (21.3)
Platelet transfusions (platelets < 10,000/μL)	30 (1.9)
G-CSF use anytime after chemotherapy initiation,[b] n (%)	1126 (71.5)
Start of G-CSF use, n (%)	
≥ 6 days after chemotherapy	375 (23.8)
5 days after chemotherapy	31 (2.0)
4 days after chemotherapy	29 (1.8)
3 days after chemotherapy	238 (15.1)
2 days after chemotherapy	446 (28.3)
1 day after chemotherapy	7 (0.4)
Type of G-CSF, n (%)	
Pegfilgrastim (Neulasta)	1029 (65.4)
Filgrastim-sndz (Zarxio)	158 (10.0)
Filgrastim (Neupogen, Accofil)	63 (4.0)
Pegfilgrastim-cbqv (Udenyca)	19 (1.2)
Other	12 (0.8)
Type of ESA, n (%)	
Darbepoetin alfa (Aranesp)	198 (12.6)
Other	13 (0.8)

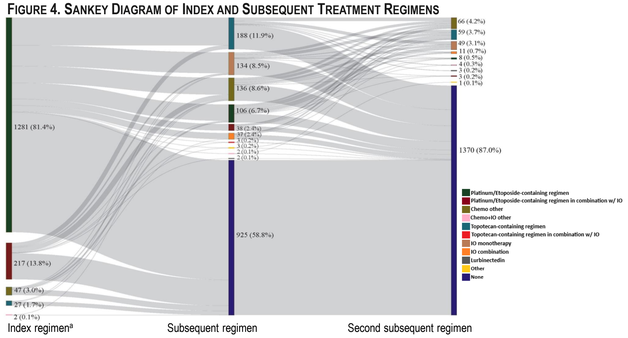
[a] Denominator was calculated based on patients with available data, not the full sample. [b] Among the 1126 G-CSF users, 321 (28.5%) had grade ≥ 3 anemia, and 266 (23.6%) had grade ≥ 3 thrombocytopenia.
ESA, erythropoiesis-stimulating agent; G-CSF, granulocyte colony-stimulating factor; RBC, red blood cell.

Figure 3. Myelosuppressive Events After Chemotherapy



[a] Mean number of grade ≥ 3 anemia events during follow-up: 2.1. [b] Mean number of grade ≥ 3 neutropenia events during follow-up: 1.9. [c] Mean number of grade ≥ 3 thrombocytopenia events during follow-up: 2.4.
ES-SCLC, extensive-stage small cell lung cancer.

Figure 4. Sankey Diagram of Index and Subsequent Treatment Regimens



For each line of treatment, percentages were calculated using the total number of patients (N = 1574) as the denominator.
[a] 99.5% of index regimens were in first line.
Chemo, chemotherapy; IO, immuno-oncology; w/, with.

LIMITATIONS

- Owing to data limitations, health care resource utilization in the inpatient setting was not captured
- Results in this study may not be generalizable beyond community oncology settings

CONCLUSIONS

- Results from this retrospective study suggest there is a significant burden related to myelosuppression among patients with ES-SCLC in a US community oncology setting
- Chemotherapy-induced myelosuppression was prevalent, and a notable proportion of patients had myelosuppression in ≥2 lineages
- Close to one-third of patients received < 4 chemotherapy cycles of the index treatment, which underscores the fragility of patients with ES-SCLC
- Therapies to protect bone marrow from myelosuppression have potential to reduce the burden on patients

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