# Prevalence of Small Cell Lung Cancer in US Patients with Lambert-Eaton Myasthenic Syndrome: A Contemporary Real-World Data Analysis

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## Introduction and Objective

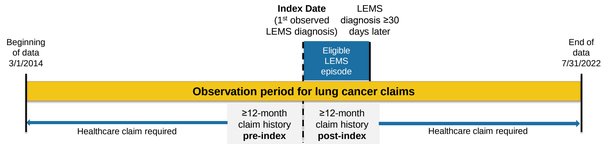
- Lambert-Eaton myasthenic syndrome (LEMS) is a rare autoimmune disorder characterized by proximal muscle weakness, loss of tendon reflexes, and autonomic dysfunction that can occur as a paraneoplastic disorder, most commonly in association with small cell lung cancer (SCLC)[1-3]
  - SCLC is estimated to occur in approximately 40%-60% of patients with LEMS and has been associated with improved SCLC survival[2,4-8]
  - Due to this strong association with cancer, the diagnosis of LEMS should prompt cancer screening[9]
- Previous studies investigating SCLC among patients with LEMS were conducted across different time periods outside the United States (US) and information about patients in the US is sparse[10]
- **Therefore, the objective of this study was to investigate the frequency of SCLC among patients with LEMS in the US**

## Methods

### *Study data and design*

- Healthcare claims from a large US de-identified dataset (Symphony Health's PatientSource®, 3/1/2014-7/31/2022) were used to identify patients with LEMS (ICD-9-CM: 358.3, 358.30, 358.31, 358.39 or ICD-10-CM: G70.80, G70.81, G73.1)
  - Patients with ≥2 claims ≥30 days apart[11] were considered to have a confirmatory LEMS diagnosis
  - The first observed LEMS claim served as the patient's index date **(Figure 1)**
- Patients with lung cancer (ICD-9-CM 162.X excluding 162.0, ICD-10-CM C34.X), and/or SCLC-related therapies (etoposide and platinum; "treated SCLC") were identified based on ≥2 claims ≥30 days apart
  - In the absence of diagnosis codes specific for SCLC in ICD-9-CM and ICD-10-CM, a lung cancer diagnosis was presumed to be SCLC among patients with LEMS given the previously known association between SCLC and tumor-associated LEMS[1]
- The prevalence of SCLC was estimated among patients with eligible claims for LEMS during the study period
  - A sensitivity analysis was also performed to estimate the proportion of patients with treated SCLC overall and among those with continuous healthcare utilization (≥12 months pre- and post-index LEMS claim)

**Figure 1.** Study design



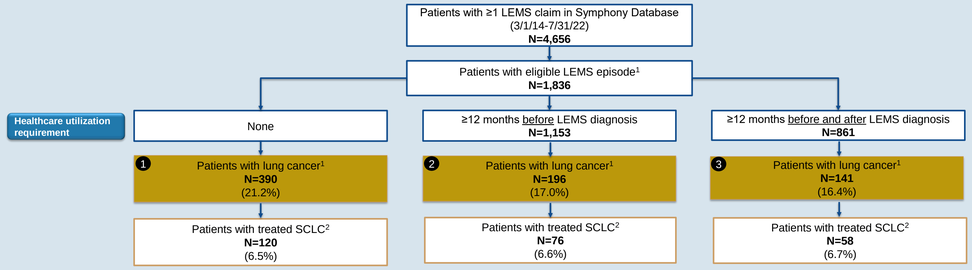

[1]Based on 2 diagnoses ≥30 days apart. Note: lung cancer cases are presumed to be SCLC in the absence of a specific ICD code for SCLC

### *Analysis*

- In the absence of diagnosis codes specific for SCLC in ICD-9-CM and ICD-10-CM, diagnoses of lung cancer among patients with LEMS were presumed to be SCLC, and the prevalence of SCLC and treated SCLC among patients with LEMS was estimated:
  - ❶ Overall, among patients with LEMS;
  - ❷ Among those with LEMS and ≥12 months claims history preceding the index LEMS claim;
  - ❸ Among those with LEMS and continuous healthcare utilization (≥12 months pre- and post-index LEMS claim)
- The time between the earliest SCLC and LEMS diagnoses was assessed
- Patient demographic characteristics were assessed on index date; data were descriptive, and no statistical comparisons were performed

## Results

**Figure 2.** Estimated Prevalence of SCLC in Patients with LEMS




[1]Based on 2 diagnoses ≥30 days apart. [2]Based on 2 lung cancer diagnoses ≥30 days apart and receipt of etoposide and platinum therapy. Note: lung cancer cases were presumed to be SCLC in the absence of a specific ICD code for SCLC.

### *Estimated Prevalence of LEMS in Patients with SCLC*

- 4,656 US patients with LEMS diagnoses between 2014 and 2022 were identified in the Symphony Health database;1,836 had ≥2 LEMS diagnoses ≥30 days apart and were eligible for inclusion in the study **(Figure 2)**
  - Overall, 390 (21.2%) patients with LEMS had lung cancer-related claims, among them, 120 (30.8% of LEMS-SCLC patients) received etoposide and platinum-based therapies associated with SCLC
  - The prevalence of SCLC among patients with LEMS in the database during this period ranged from 16.4% (≥12 months of healthcare utilization pre- and post-index) to 21.2% (any healthcare utilization)
  - The prevalence of treated SCLC among patients with LEMS ranged from 6.5% overall to 6.7% among patients with continuous healthcare utilization before and after the index LEMS diagnosis

**Table 1.** Patient baseline characteristics assessed on the index date

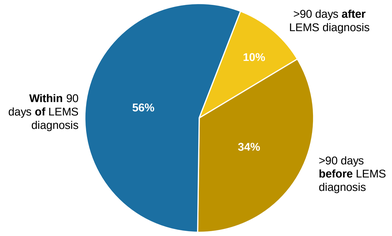
| | LEMS[1] N=1,836 | SCLC-LEMS[2] N=390 |
|---|---|---|
| **Age, years, mean ± SD** | 60.2 ± 14.2 | 65.7 ± 7.6 |
| **Female, n (%)** | 1,052 (57) | 212 (54) |
| **Insurance coverage, n (%)**[3] | | |
| Commercial | 1,143 (62) | 210 (54) |
| Medicare | 372 (20) | 79 (20) |
| Medicaid | 81 (4) | 23 (6) |
| Other[4] | 28 (2) | 6 (2) |
| Unknown | 212 (12) | 72 (18) |
| **Census Region, n (%)** | | |
| Northeast | 360 (20) | 79 (20) |
| Midwest | 450 (25) | 103 (26) |
| South | 706 (38) | 149 (38) |
| West | 301 (16) | 58 (15) |
| Unknown | 2 (0) | 0 |
| **Receipt of etoposide + platinum therapy, n (%)** | 120 (6.5%) | 120 (31%) |

[1]Based on 2 diagnoses ≥30 days apart; [2]Lung cancer cases are presumed to be SCLC in the absence of a specific ICD code for SCLC; [3]Includes patients with a combination of commercial and other insurance types; [4]Includes patients with other government-sponsored insurance

### *Patient Characteristics*

- Patients with LEMS were mostly (57%) female, mean age of 60.2 ± 7.6 years at the index date, from the Southern US Census region, and most had commercial insurance **(Table 1)**
- In contrast, patients with SCLC-LEMS were on average older (mean age 65.7 ± 7.6 years) and a smaller proportion of patients were commercially insured relative to patients with LEMS overall
  - Demographic characteristics for patients with SCLC-LEMS were similar for those with continuous pre- and post-index healthcare resource utilization (data not shown)

**Figure 3.** Proportion of patients with SCLC-LEMS according to timing of SCLC diagnosis[1]



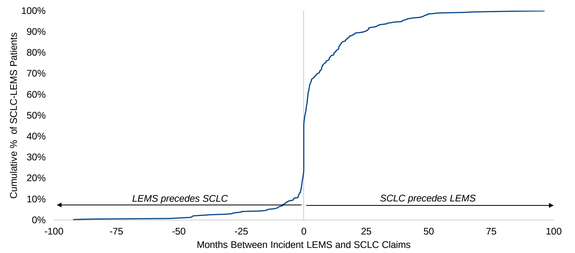

[1]Among n=390 patients with SCLC-LEMS

### *Timing of SCLC and LEMS*

- Data on the timing of diagnoses (dx) for 390 patients with SCLC-LEMS* are presented in **Figures 3 and 4**
- Most patients (56%) were diagnosed with SCLC concurrent with LEMS **(Figure 3)**
  - Among those whose SCLC claim was >90 days **before** their index LEMS claim, the mean (median) time between diagnoses was 20.0 (14.3) months
  - Among those whose SCLC claim was >90 days **after** their index LEMS claim, the mean (median) time between diagnoses was 22.5 (12.3) months

Note: lung cancer cases were presumed to be SCLC in the absence of a specific ICD code for SCLC.

**Figure 4.** Timing associated with SCLC-LEMS diagnosis




[1]Among n=390 patients with SCLC-LEMS; [2]Lung cancer cases are presumed to be SCLC in the absence of a specific ICD code for SCLC

## Limitations

- The claims data used in this analysis relies upon ICD coding and may not capture all LEMS- and SCLC-diagnosed patients
- As SCLC is not associated with a unique ICD code, there is potential for inclusion of patients with other types of lung cancer. However, LEMS is known to be strongly associated with SCLC[1] and our sensitivity analysis was restricted to patients who received etoposide and platinum-based therapies associated with SCLC to address this risk
- The requirement of healthcare utilization claims post-index diagnosis in the sensitivity analysis risks introducing survival bias as patients with SCLC may not survive long enough to be diagnosed with LEMS; however, this enables the estimation of SCLC-LEMS in the setting of LEMS diagnostic delay

## Conclusions

- SCLC has been reported among half of LEMS patients in prospective international studies, but among US-diagnosed LEMS patients, SCLC is found in approximately 20%
- These findings suggest patients with SCLC are not screened for LEMS, and, as a result, the observed prevalence of SCLC in this analysis was approximately half of that previously reported in the literature
- Future analyses examining additional data sources to verify the data presented in this abstract are planned

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**Disclosures** DM – employee, shareholder of Catalyst Pharmaceuticals; NS - none; BD – consulting Sonata Therapeutics; RG, GS - consultants to Catalyst Pharmaceuticals

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