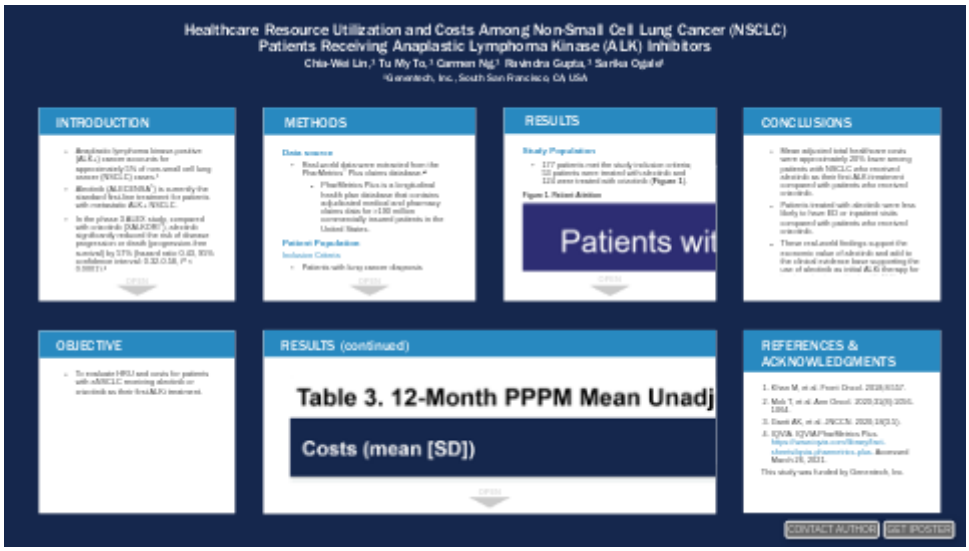
Healthcare Resource Utilization and Costs Among Non-Small Cell Lung Cancer (NSCLC) Patients Receiving Anaplastic Lymphoma Kinase (ALK) Inhibitors



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PRESENTED AT:

INTRODUCTION

- Anaplastic lymphoma kinase-positive (ALK+) cancer accounts for approximately 5% of non-small cell lung cancer (NSCLC) cases.[1]
- Alectinib (ALECENSA®) is currently the standard first-line treatment for patients with metastatic ALK+ NSCLC.
- In the phase 3 ALEX study, compared with crizotinib (XALKORI®), alectinib significantly reduced the risk of disease progression or death (progression-free survival) by 57% (hazard ratio 0.43, 95% confidence interval: 0.32-0.58, $P < 0.0001$).[2]
- In addition, a real-world study demonstrated significantly longer treatment persistence for alectinib vs. crizotinib.[3]
- However, real-world healthcare resource utilization (HRU) and total cost of care associated with treating advanced NSCLC (aNSCLC) patients with ALK+ NSCLC remains unknown.

METHODS

Data source

- Real-world data were extracted from the PharMetrics® Plus claims database.[4]
  - PharMetrics Plus is a longitudinal health plan database that contains adjudicated medical and pharmacy claims data for >190 million commercially insured patients in the United States.

Patient Population

Inclusion Criteria

- Patients with lung cancer diagnosis (International Classification of Diseases, Ninth Revision [ICD-9]: 162, ICD-10: C34) between 1/1/2015 and 6/30/2019.
- Initiated first ALKi therapy between 7/1/2015 and 6/30/2019 (index date was defined as date of the first ALKi prescription).
- Had 6+ months of preindex continuous enrollment with both medical and pharmacy benefits and no ALKi therapy in this baseline period.
- Patients were ≥18 years old at diagnosis and had 12+ months of postindex continuous enrollment.

Exclusion Criteria

- Participation in a clinical trial during continuous enrollment (start of baseline to postindex period) or enrolled in health maintenance organization (HMO) plans.

Study Design

- This was a real-world retrospective observational study that identified adult patients in the United States with NSCLC who were treated with the ALK inhibitors alectinib or crizotinib between July 1, 2015, and June 30, 2019.

Outcomes

- Patient demographics and characteristics
- Treatment characteristics: duration of line of therapy [LOT], time to next treatment (any therapy and ALKi therapy)
- HRU: emergency department (ED) visits, hospitalizations
- Costs: total, medical (inpatient and outpatient), and pharmacy

Statistical analyses

- Descriptive statistics were used for patient characteristics, HRU, and per-patient-per- month (PPPM) costs during the 12 months postindex.

- Multivariate generalized linear model with log-link and gamma distribution was applied to estimate total costs of care, adjusting for the following baseline characteristics: age, sex, region, plan type, payer type, Charlson comorbidity index, presence of brain metastases at baseline, cancer immunotherapy at baseline, chemotherapy at baseline, year of ALKi index date.

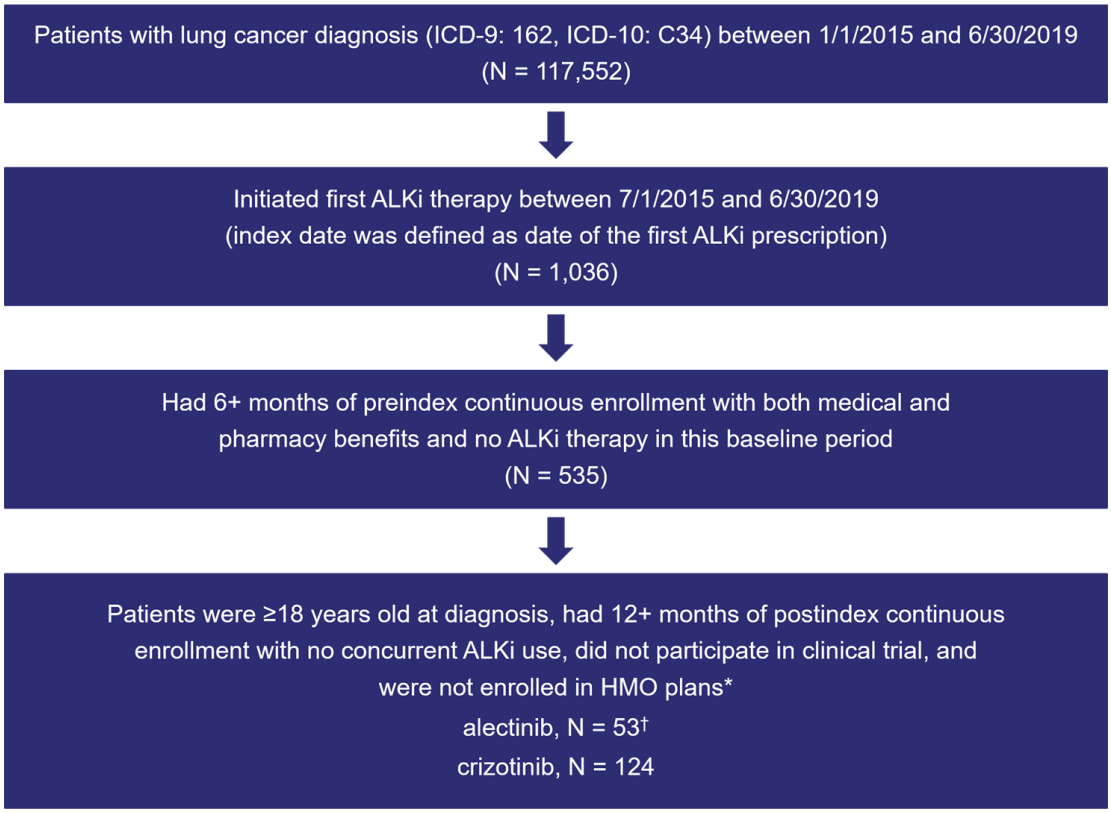
- All costs were adjusted to 2019 United States dollars (USD).

RESULTS

Study Population

- 177 patients met the study inclusion criteria; 53 patients were treated with alectinib and 124 were treated with crizotinib (**Figure 1**).

Figure 1. Patient Attrition



*HMO patients were excluded since their cost component cannot be analyzed under capitated payments.

†8 patients receiving ceritinib were excluded from the analysis because of small sample sizes.

ALKi, anaplastic lymphoma kinase inhibitor; HMO, health maintenance organization; ICD-9, International Classification of Diseases, Ninth Revision.

Patient Demographics and Characteristics

- Baseline characteristics between patients treated with alectinib and crizotinib are presented in **Table 1**.
  - The mean (standard deviation [SD]) age of patients was 54.5 (10.0) for alectinib and 55.3 (10.8) for crizotinib.
  - A greater number of crizotinib patients were male (57.3%) compared with alectinib patients (45.3%).
  - A greater number of alectinib patients had brain metastases at baseline (11.3%) compared with crizotinib patients (7.3%).
  - Other baseline characteristics were well balanced with the exception of the index year.

Table 1. Baseline Characteristics by Treatment

Characteristic	Alectinib (N = 53)	Crizotinib (N = 124)
Age, year, mean (SD)	54.5 (10.0)	55.3 (10.8)
Age group, n (%)		
<35	1 (1.9)	6 (4.8)
35-44	7 (13.2)	15 (12.1)
45-54	16 (30.2)	28 (22.6)
55-64	24 (42.3)	62 (50.0)
65+	5 (9.4)	13 (10.5)
Male, n (%)	24 (45.3)	71 (57.3)
Region, n (%)		
East	9 (17.0)	29 (23.4)
Midwest	14 (26.4)	32 (25.8)
South	27 (50.9)	52 (41.9)
West	3 (5.7)	11 (8.9)
Plan type, n (%)		
PPO	51 (96.2)	114 (91.9)
Other/unknown	2 (3.8)	10 (8.1)
Payer type, n (%)		
Commercial	34 (64.2)	82 (66.1)
Self-insured	19 (35.9)	37 (29.8)
Other/unknown	0	5 (4.0)
CCI: noncancer, mean (SD)	0.91 (1.08)	0.98 (1.17)
CCI: noncancer, n (%)		
0	26 (49.1)	58 (46.8)
1-2	22 (41.5)	53 (42.7)
≥3	5 (9.4)	13 (10.5)
Presence of brain metastases at baseline, n (%)*	6 (11.3)	9 (7.3)
Systemic treatment at baseline		
Cancer immunotherapy	4 (7.5)	5 (4.0)
Chemotherapy	10 (18.9)	27 (21.8)
Year of ALKi index date†		
2015	0	20 (16.1)
2016	5 (9.4)	58 (46.8)
2017	28 (52.8)	27 (21.8)
2018	20 (37.7)	19 (15.3)
Follow-up, median† (minimum, maximum)	19 (12,43)	22 (12,48)
Duration of index ALKi therapy,† months, median (minimum, maximum)	17.2 (4.0, 39.1)	11.7 (4.0, 45.6)

*Prevalence of brain metastases at baseline may be underreported in our study because sites of metastases are often underreported in claims data.

†$P < 0.05$.

ALKi, anaplastic lymphoma kinase inhibitor; CCI, Charlson comorbidity index; PPO, preferred provider organization; SD, standard deviation.

Healthcare Resource Utilization

- In the 12 months postindex, patients treated with alectinib were significantly less likely to have ED and inpatient visits than patients treated with crizotinib (**Table 2**).
  - ED visits: alectinib = 24.5% vs crizotinib = 40.3%, *P* = 0.044
  - Inpatient visits: alectinib = 22.6% vs crizotinib = 41.3%, *P* = 0.019

Table 2. 12-Month Postindex Healthcare Resource Utilization

	Alectinib (N = 53)	Crizotinib (N = 124)
Any ED visit, n (%)*	13 (24.5)	50 (40.3)
Number of ED visits,† mean (SD)	3.5 (2.6)	3.4 (2.6)
Any inpatient visits, n (%)*	12 (22.6)	51 (41.3)
Number of hospitalizations,‡ mean (SD)	1.8 (1.7)	2.0 (1.2)
LOS, days mean (SD)	20.6 (45.5)¶	12.7 (13.5)

**P* < 0.05.

†Among patients with any ED visit.

‡Among patients with any hospitalization.

¶Outliers contributed to the observed difference in LOS days between alectinib and crizotinib.

ED, emergency department; LOS, length of stay; SD, standard deviation.

Costs

- The unadjusted total cost of care was lower for patients treated with alectinib vs crizotinib (unadjusted mean PPPM cost: $18,461 vs $21,307, *P* = 0.069) (**Table 3**).
  - Patients treated with alectinib had lower unadjusted mean inpatient and outpatient costs than patients treated with crizotinib.
  - Unadjusted ALKi pharmacy costs were similar for patients treated with alectinib vs crizotinib.
- After adjusting for the baseline characteristics, the total cost of care for patients treated with alectinib was 19.5% lower than for patients treated with crizotinib.
  - Mean adjusted PPPM cost: alectinib = $15,536 vs crizotinib = $19,303, *P* = 0.005) (**Figure 2**).

CONCLUSIONS

- Mean adjusted total healthcare costs were approximately 20% lower among patients with NSCLC who received alectinib as their first ALKi treatment compared with patients who received crizotinib.
- Patients treated with alectinib were less likely to have ED or inpatient visits compared with patients who received crizotinib.
- These real-world findings support the economic value of alectinib and add to the clinical evidence base supporting the use of alectinib as initial ALKi therapy for treatment-naive patients with ALK+ NSCLC.

OBJECTIVE

- To evaluate HRU and costs for patients with aNSCLC receiving alectinib or crizotinib as their first ALKi treatment.

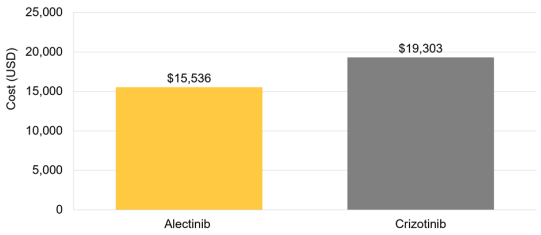
RESULTS (CONTINUED)

Table 3. 12-Month PPPM Mean Unadjusted Healthcare Costs

Costs (mean [SD])	Alectinib (N = 53)	Crizotinib (N = 124)
Total costs	**$18,461 ($7,012)**	**21,307 ($10,332)**
Inpatient	$1,005 ($2,736)	$2,240 ($6,461)
Outpatient	$4,394 ($4,288)	$5,699 ($5,409)
Emergency department	$37 ($89)	$60 (122)
Radiation therapy	$416 ($962)	$886 ($1,890)
Head/brain radiology imaging	$548 ($748)	$564 (723)
Other radiology imaging	$509 ($521)	$562 (643)
Pharmacy		
Cost of ALK inhibitors	**$12,749 ($4,795)**	**$12,825 ($5,735)**
Other pharmacy cost	$312 ($911)	$543 ($1,497)

ALK, anaplastic lymphoma kinase; PPPM, per patient per month; SD, standard deviation.

Figure 2. Adjusted PPPM Costs for Patients Treated with Alectinib and Crizotinib



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