# Factors Associated with the Use of Immune Checkpoint Inhibitors in Older Adults with Metastatic Non-Small Cell Lung Cancer and Pre-Existing Autoimmune Disease: A SEER-Medicare Study College of Pharmacy UNIVERSITY OF HOUSTON <u>Shrey Gohil<sup>1</sup>, Hua Chen<sup>1</sup>, Whitney E. Lewis<sup>2</sup>, Meghana Trivedi<sup>1</sup>, Rajender R. Aparasu<sup>1</sup>, Michael L. Johnso</u>

### OBJECTIVE

The presence of pre-existing autoimmune disease (PAD) with metastatic non-small cell lung cancer (mNSCLC) poses challenges in the use of immune checkpoint inhibitors (ICIs). This study investigated factors influencing ICI utilization in older adults with mNSCLC and PAD.

## METHODS

A retrospective cohort study with a 12-month baseline prior to treatment initiation was conducted using the SEER-Medicare data. Patients aged 66 years and above diagnosed with mNSCLC from January 2015 to December 2017 who initiated immunotherapy only/chemoimmunotherapy (IT/CIT) or chemotherapy only (CT) were included. Multiple factors, guided by the Model of Health Services Utilization, were analyzed using multivariable logistic regression. Adjusted odds ratios (aORs) and 95% confidence intervals (95%Cls) were reported.

# Figure 1. Treatment Definitions

### Immunotherapy only (IT)

• If a patient's first treatment claim is for an ICI, followed by no claim for any chemotherapy agent in the next 42 days

### Chemoimmunotherapy (CIT)

• If a patient's first treatment claim is for an ICI or a chemotherapy agent, followed by at least 1 claim for a chemotherapy agent or ICI, respectively, in the next 42 days

### Chemotherapy only (CT)

• If a patient's first treatment claim is for a chemotherapy agent, followed by no claim for any ICI in the next 42 days

# RESULTS

# **Figure 2. Attrition Chart**

Patients with first or only primary cancer as NSCLC, age  $\geq 66$  years, 2015-2017 n = 70,014 Metastatic NSCLC n = 21,533 Had at least one initiation claim for IT/CIT or CT after mNSCLC diagnosis n = 5,501 Had at least one AD claim before IT/CIT or CT initiation n = 2,181 Continuous Medicare coverage one year before IT/CIT or CT initiation n = 1,319 Abbr.: NSCLC, non-small cell lung cancer; IT/CIT, immunotherapy only/chemoimmunotherapy; CT, chemotherapy only; AD, autoimmune disease

# <sup>1</sup>University of Houston College of Pharmacy, Houston, TX, USA; <sup>2</sup>MD Anderson Cancer Center, Houston, TX,





### RESULTS

Among 1,319 patients initiating first-line (1L) systemic treatment, 22.28% received IT/CIT, and 77.71% received CT. Patients initiating IT/CIT were more likely to be 76-80 years old (aOR=1.695, 95%CI=1.023-2.808) and >80 years old (aOR=2.491, 95%CI=1.459-4.253), residing in South (aOR=2.324, 95%CI=1.363-3.964) and West (aOR=2.272, 95%CI=1.436-3.595) SEER regions, diagnosed in 2016 (aOR=6.360, 95%CI=3.060-13.220) and 2017 (aOR=40.454, 95%CI=19.702-83.065), having a longer time to treatment initiation (aOR=1.136, 95%CI=1.081-1.194), having non-squamous tumor histology (aOR=1.511, 95%CI=1.048-2.179), and having a prior hospitalization (aOR=1.625, 95%CI=1.136-2.325). These patients were less likely to have recently used an immunosuppressant (IS) (aOR=0.062, 95%CI=0.037-0.103).

# Table 1. Patient Demographics

Characteristic	IT/CIT	СТ	p-value	40.00
tal patients (n, %)	294 (100)	1,025 (100)		30.00 —
edisposing factors				20.00
e at diagnosis (n, %)			<.0001	0.00
-70 years	56 (19.05)	295 (28.78)		Ch
-75 years	74 (25.17)	332 (32.39)		
-80 years	84 (28.57)	244 (23.80)		
0 years	80 (27.21)	154 (15.02)		Abbr.: PAD
ER region (n, %)			0.0001	CT, chemot
ortheast	65 (22.11)	274 (26.73)		
dwest	20 (6.80)	153 (14.93)		Tab
uth	77 (26.19)	246 (24.00)		IdD
est	132 (44.90)	352 (34.34)		
abling factors				
G reason for Medicare entitlement (n, %)			0.015	Age at di
d age	263 (89.46)	858 (83.71)		66-70 ye
sability/ESRD	31 (10.54)	167 (16.29)		71-75 ve
ed factors				, 76-80 ve
ar of cancer diagnosis (n, %)			<.0001	>80 year
15	11 (3.74)	387 (37.76)		SEED root
16	65 (22.11)	384 (37.46)		SEENTEg
17	218 (74.15)	254 (24.78)		Northeas
ne to treatment initiation (months)			0.0002	Midwest
ean (SD)	3.08 (5.07)	1.93 (2.23)		South
edian	1.63	1.47		West
mor histology at cancer diagnosis (n, %)			0.0116	Year of ca
her <sup>c</sup>	88 (29.93)	389 (37.95)		2015
on-squamous	206 (70.07)	636 (62.05)		2016
cent radiation therapy <sup>d</sup> (n, %)			0.0112	2017
	214 (72.79)	665 (64.88)		Time to t
S	80 (27.21)	360 (35.12)		Tumor hi
pe of PAD – RA or not (n, %)			0.0458	Other <sup>c</sup>
)	246 (83.67)	803 (78.34)		Non cau
S	48 (16.33)	222 (21.66)		Decent in
cent immunosuppressant use <sup>e</sup> (n, %)			<.0001	Recent In
)	118 (40.14)	51 (4.98)		NO
S	176 (59.86)	974 (95.02)		Yes
-cause hospitalization (n, %)			0.0026	Prior hos
)	127 (43.20)	545 (53.17)		No
S	167 (56.80)	480 (46.83)		Yes

Abbr.: mNSCLC, metastatic non-small cell lung cancer; PAD, pre-existing autoimmune disease; IT/CIT, immunotherapy only/chemoimmunotherapy; CT, chemotherapy only; LCL, lower confidence limit; UCL, upper confidence limit; OR, odds ratio; SEER, Survey Epidemiology and End Results; OG, original; ESRD, end-stage renal disease; MSA, metropolitan statistical area; RA, rheumatoid arthritis; NCI, National Cancer Institute <sup>a</sup> Includes Asian, and Native American/Pacific Islanders; <sup>b</sup> Includes single, separated, divorced, widowed, or unmarried or domestic partner (same sex or opposite sex or unregistered); <sup>c</sup> Includes squamous cell carcinoma and not otherwise specified; <sup>d</sup> Within the 30 days prior to initiation; <sup>e</sup> Within the 90 days prior to initiation

# CONCLUSIONS

Several factors, such as age, region, cancer diagnosis year, time to treatment initiation, and recent IS use, intricately shape treatment decisions. Further in-depth research on each of these factors is imperative to optimize strategies for this distinctive patient population.

	Contact Information:
on <sup>1</sup> , USA	University of Houston Email: smgohil@central.uh.edu Poster Code: HSD75

# Figure 3. Distribution of PADs (%)



Abbr.: PADs, pre-existing autoimmune diseases; IT/CIT, immunotherapy only/chemoimmunotherapy; T, chemotherapy only

# Table 2. Multivariate Model

Characteristic	Adjusted OR	LCL	UCL
gnosis			
S	Reference		
S	1.195	0.732	1.951
S	1.695	1.023	2.808
	2.491	1.459	4.253
n			
	Reference		
	1.005	0.509	1.983
	2.324	1.363	3.964
	2.272	1.436	3.595
ncer diagnosis			
	Reference		
	6.360	3.060	13.220
	40.454	19.702	83.065
eatment initiation	1.136	1.081	1.194
ology at cancer diagnosis			
	Reference		
nous	1.511	1.048	2.179
munosuppressant use <sup>e</sup>			
	Reference		
	0.062	0.037	0.103
italization			
	Reference		
	1.625	1.136	2.325
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