2560eP: PREVALENCE OF EMPHYSEMA IN PATIENTS WITH NON-SMALL LUNG CANCER (NSCLC)

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BACKGROUND

Emphysema, defined by low-attenuation areas (LAA) < -950 Hounsfield units, a major phenotype of chronic obstructive pulmonary disease (COPD), and is strongly associated with tobacco exposure and shares common pathogenic pathways with NSCLC. Characterizing the prevalence of emphysema in NSCLC may improve risk stratification and inform clinical management.

METHODS

This retrospective analysis included patients with confirmed NSCLC from three internal clinical trial cohorts (one phase II and two phase III). Chest computed tomography (CT) scans were systematically reviewed, and emphysema presence and severity were quantified using validated in-house imaging software (Figure 1-2). Prevalence rates were calculated, with subgroup analyses according to age and gender (Table 1).

RESULTS

A total of 469 patients were included (112, 109, and 248 patients per cohort). Emphysema was highly prevalent, with most patients presenting moderate to severe disease. The mean age was comparable across emphysema severity categories, with no clinically significant differences between groups. A strong gender imbalance was observed across emphysema severity levels. Moderate and severe emphysema were observed in male patients. In contrast, patients without emphysema were more frequently female.

FIGURES OF INTEREST

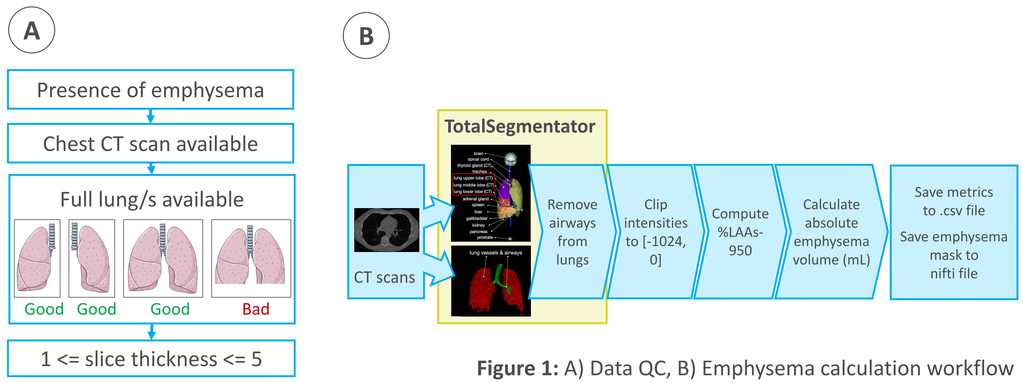


Figure 1: A) Data QC, B) Emphysema calculation workflow

Automated lung segmentation was performed using the TotalSegmentator deep-learning framework. Wasserthal J, Breit HC, Meyer MT, et al. TotalSegmentator: Robust Segmentation of 104 Anatomic Structures in CT Images. Radiology: Artificial Intelligence. 2023;5(5):e230024. doi:10.1148/ryai.230024

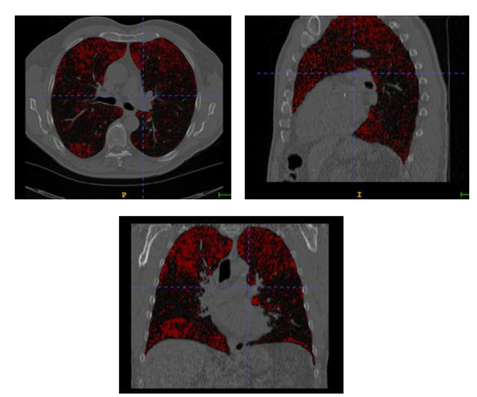


Figure 2: Emphysema estimation mask

Dataset	Emphysema prevalence % (95% CI)	LAA-950 grade	LAA-950 Range %	Age, years, mean (± std)	gender (count) M	gender (count) F
1	100 (96.68 - 100)	Mild	8.93	53.56 ± 0.29	7	3
		Moderate	10.71	53.42 ± 0.35	10	2
		Severe	80.36	53.49 ± 0.34	81	9
2	94.50 (88.51 - 97.45)	None	5.50	50.27 ± 0.58	2	4
		Mild	28.44	50.27 ± 0.60	25	6
		Moderate	21.10	50.28 ± 0.55	19	4
		Severe	44.95	50.08 ± 0.66	41	8
3	88.35 (83.77-91.77)	None	11.30	50.43 ± 0.58	5	23
		Mild	51.61	50.51 ± 0.58	61	67
		Moderate	12.50	50.51 ± 0.55	19	12
		Severe	24.60	50.72 ± 0.55	30	31
Merged	92.55 (89.82 - 94.60)	None	7.25	50.40 ± 0.57	7	27
		Mild	36.03	50.65 ± 0.93	93	76
		Moderate	14.07	50.98 ± 1.27	48	18
		Severe	42.64	51.81 ± 1.62	152	48

Table 1: Prevalence of emphysema

CONCLUSIONS

Emphysema is highly prevalent among patients with NSCLC and may significantly affect clinical outcomes and treatment decisions. Systematic assessment of emphysema in NSCLC patients could support more personalized care and prognostic evaluation. Prospective studies are necessary to further define its impact on survival and treatment response.

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