Lung function decline and hospitalization among patients with non-IPF fibrosing interstitial lung disease as observed in a large real-world electronic health record database

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INTERACTIVE

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BACKGROUND AND OBJECTIVE

- Patients with chronic fibrosing interstitial lung disease (fibrosing ILD) can develop a progressive phenotype with worsening lung function and symptoms, and/or increased fibrosis.
- Outside of idiopathic pulmonary fibrosis (IPF), little real-world evidence is available on the association between FVC decline and health care utilization
- The aim of this study was to examine the association between forced vital capacity (FVC) decline and hospitalization in patients with fibrosing ILD.

METHODS

- **Study design:** This was a retrospective cohort study of patients (age ≥ 18) with fibrosing ILD. Diagnosis codes were accessed via electronic health records in the Optum Clinical Database, from 4/1/2016 to 1/31/2019; the date of earliest diagnosis set index date.
- **Study population:** Patients had ≥1 FVC value ±30 days of the index diagnosis (index FVC value) and 6 months later (FVC measurement period), and clinical activity 6 months pre- to >9 months post-index.
  - Exclusion criteria were IPF diagnosis, nintedanib or pirfenidone prescription, or missing demographics.
  - Cohorts were defined by relative change in percent of predicted FVC (FVC%) from baseline to 6 months: significant decline (≥10%) vs marginal decline/stable (<10% declineor increase).
- Underlying ILD conditions and select comorbidities were identified. The occurrence of post-index inpatient visits was recorded.
- **Analysis:** Descriptive and multivariable analyses were conducted to determine odds of inpatient visits controlling for demographics, underlying conditions, medications, index FVC% (<80% vs. ≥80%), FVC decline, and interaction between index FVC% and FVC decline.

STUDY LIMITATIONS

- Limitations may include coding errors or missed encounters outside of participating health organizations.
- Inconsistent spirometry data availability may bias selection.

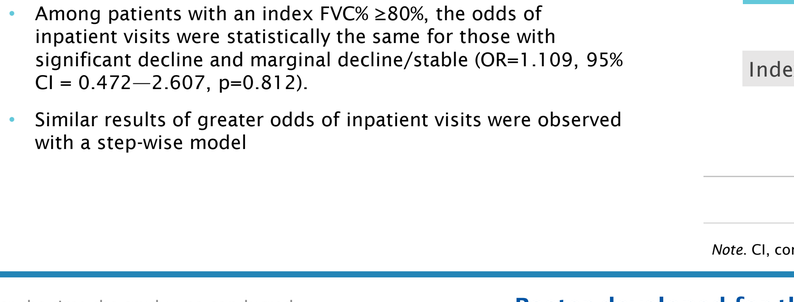
CONCLUSIONS

- Significant lung function FVC decline of ≥10% was associated with increased odds of inpatient visits in patients with reduced FVC (<80%) at baseline.
- These findings support the importance of preserving lung function in patients with fibrosing ILD.

RESULTS

- Among patients identified with fibrosing ILD and ≥2 FVC measures; 566 met study criteria (Figure 1).

Figure 1. Sample Selection



Note. FVC, forced vital capacity; ILD, interstitial lung disease; IPF, idiopathic pulmonary fibrosis

- 75 (13.2%) patients had significant decline and 491 (86.7%) had marginal decline or stable FVC% (Table 1).

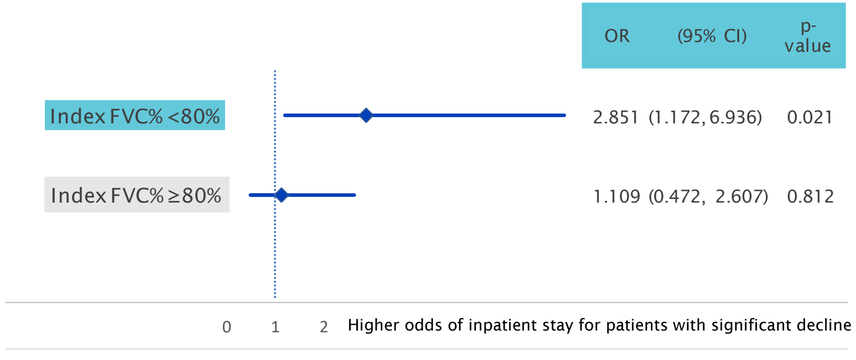
Table 1. Select Patient Baseline Characteristics by FVC Decline Cohort

	Significant Decline (N=75)	Marginal Decline/Stable (N=491)	p-value
Age, mean (SD)	66.1 (13.1)	64.5 (13.8)	0.338
Female, n (%)	41 (54.7)	277 (56.4)	0.776
Index FVC ≥80%, n (%)	46 (61.3)	200 (40.7)	<0.001
Index FVC, mean (SD)	3.1 (2.1)	2.8 (1.2)	0.021
Underlying Conditions			
Rheumatoid arthritis, n (%)	5 (6.7)	43 (8.8)	0.545
Lupus, n (%)	5 (6.7)	13 (2.9)	0.065
Sjogren's syndrome, n (%)	2 (2.7)	7 (1.4)	0.424
Scleroderma, n (%)	6 (6.7)	23 (4.7)	0.461
Mixed connective tissue disease, n (%)	1 (1.3)	13 (2.7)	0.495
Dermatomyositis/polymyositis, n (%)	3 (4.0)	4 (0.8)	0.020
Select Comorbidities			
Asthma, n (%)	11 (14.7)	74 (15.1)	0.927
COPD, n (%)	27 (36.0)	163 (33.2)	0.632
Obstructive sleep apnea, n (%)	17 (22.7)	89 (18.1)	0.348

Note. COPD, chronic obstructive pulmonary disease; FVC, forced vital capacity; SD, standard deviation.

- After adjusting for covariates, among patients with an index FVC% <80%, those with significant decline had greater odds of inpatient visits compared to those with marginal decline/stable (OR=2.851, 95% CI = 1.172—6.936, p=0.021) (Figure 2).
- Among patients with an index FVC% ≥80%, the odds of inpatient visits were statistically the same for those with significant decline and marginal decline/stable (OR=1.109, 95% CI = 0.472—2.607, p=0.812).
- Similar results of greater odds of inpatient visits were observed with a step-wise model

Figure 2. Interaction of Significant FVC% Decline and Index FVC% on Odds of Inpatient Visits



Note. CI, confidence interval; FVC, forced vital capacity; OR, odds ratio

Disclosures: Funded by Boehringer Ingelheim Pharmaceuticals, Inc. D Singer was an employee of BIPI at the time the study was conducted.

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