Time to diagnosis of idiopathic pulmonary fibrosis in the IPF-PRO™ Registry

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INTRODUCTION

- Idiopathic pulmonary fibrosis (IPF) is a progressive interstitial lung disease with a poor prognosis.[1]
- Delays in the diagnosis of IPF have been reported,[2–4] but patient characteristics associated with diagnostic delays are not well described.
- The Idiopathic Pulmonary Fibrosis Prospective Outcomes (IPF-PRO) Registry (NCT01915511) is an observational registry of patients with IPF involving over 40 sites across the US.[5]

AIM

- To investigate the time from symptom onset and from first imaging evidence of pulmonary fibrosis to diagnosis of IPF, and patient characteristics associated with a longer time to diagnosis.

METHODS

- Data were analyzed from patients who:
  - Had been enrolled in the IPF-PRO Registry between 5 June 2014 and 11 March 2019
  - Had not been diagnosed with IPF prior to referral but received a new diagnosis of IPF at the enrolling center
  - Had a documented date in their medical records for symptom onset and/or HRCT scan showing pulmonary fibrosis.
- Patients were categorized as having a longer (>1 year) or shorter (≤1 year) time from symptom onset, and from first imaging evidence of pulmonary fibrosis, to diagnosis of IPF.
- Patient characteristics at enrollment, and time from enrollment to death or lung transplant, were compared between patients with longer (>1 year) versus shorter (≤1 year) times to diagnosis of IPF.

CONCLUSIONS

- Among patients who received their first diagnosis of IPF at an enrolling center in the IPF-PRO Registry:
  - Approximately 50% had a delay of >1 year between symptom onset and diagnosis of IPF
  - Approximately 80% were diagnosed with IPF within a year of imaging evidence of pulmonary fibrosis
  - Cardiac conditions were more frequent in patients with a time to diagnosis >1 year.
- Despite improved awareness of IPF, there remains a long period from symptom onset to diagnosis in a large proportion of patients. Getting an HRCT scan performed is a critical step in the diagnostic process.

RESULTS

Patients

554 patients with new diagnosis of IPF

56 patients with missing dates for symptom onset and imaging evidence of pulmonary fibrosis

498 patients in analysis cohort

347 patients with date for symptom onset

454 patients with date for imaging evidence of pulmonary fibrosis

303 patients had dates for both symptom onset and imaging evidence of pulmonary fibrosis.

Time from symptom onset to diagnosis of IPF

Median (Q1, Q3) time from symptom onset to diagnosis was **13.6** (5.9, 35.5) **months**

49.9% had **>1 year** from symptom onset to diagnosis

Time from imaging evidence of pulmonary fibrosis to diagnosis of IPF

Median (Q1, Q3) time from imaging evidence of pulmonary fibrosis to diagnosis was **3.5** (1.1, 9.6) **months**

21.6% had **>1 year** from imaging evidence of pulmonary fibrosis to diagnosis

Characteristics at enrollment among patients with a shorter or longer time to diagnosis of IPF

	Time from symptom onset to diagnosis		Time from imaging evidence of pulmonary fibrosis to diagnosis	
	≤1 year (n=174)	>1 year (n=173)	≤1 year (n=356)	>1 year (n=98)
FVC % predicted	67.4 (57.0, 79.8)	69.4 (57.2, 79.9)	70.7 (59.3, 80.8)	72.4 (60.1, 84.1)
DLco % predicted	41.8 (32.6, 50.8)	40.5 (31.8, 49.8)	43.7 (33.5, 52.7)	40.5 (32.1, 47.5)
Oxygen use at rest	22.4	25.6	18.4	21.1
Oxygen use with activity	31.8	39.2	29.5	30.2
GERD	53.4	58.7	52.0	56.3
Coronary artery disease	24.7	31.4	30.7	33.3
Obstructive sleep apnea	27.2	32.2	29.1	26.0
Diabetes	23.0	21.5	18.0	29.9
Hiatial hernia	15.5	19.9	14.4	22.9
Atrial fibrillation or flutter	6.9	10.5	7.6	15.8
Congestive heart failure	5.8	5.2	7.4	8.3
Pulmonary hypertension	6.3	7.1	6.2	8.3
Prior DVT or pulmonary embolism	2.9	5.9	4.2	7.4
Prior stroke or intracranial hemorrhage	4.3	2.9	3.8	6.6
Barrett's esophagus	3.4	2.3	1.7	5.2

Data are % or median (Q1, Q3). GERD, gastroesophageal reflux disease. DVT, deep vein thrombosis.

Time to death or lung transplant

- There was no significant difference in time from enrollment into the registry to death or lung transplant between patients with a longer (>1 year) versus shorter (≤1 year) time to diagnosis.

	Time from symptom onset to diagnosis of IPF	
	≤1 year	>1 year
1-year mortality/lung transplant rate	13.3%	10.6%
Risk of death/lung transplant for >1 year vs ≤1 year in univariable model	HR 0.83 (95% CI: 0.53, 1.30); p=0.41	
Risk of death/lung transplant for >1 year vs ≤1 year in adjusted* model	HR 0.76 (95% CI: 0.48, 1.21); p=0.25	

	Time from imaging evidence of pulmonary fibrosis to diagnosis of IPF	
	≤1 year	>1 year
1-year mortality/lung transplant rate	10.4%	7.8%
Risk of death/lung transplant for >1 year vs ≤1 year in univariable model	HR 0.85 (95% CI: 0.51, 1.43); p=0.55	
Risk of death/lung transplant for >1 year vs ≤1 year in adjusted* model	HR 0.72 (95% CI: 0.42, 1.24); p=0.24	

Analyzed using a Cox proportional hazards models.
*Adjusted model included variables previously identified as being associated with death or lung transplant in this registry (use of supplemental oxygen at rest or with activity, FVC % predicted, DLco % predicted)[6] and age.

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INTERACTIVE

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IPF-PRO™ Registry enrolling centers: Albany Medical Center, Albany, NY; Baylor College of Medicine, Houston, TX; Baylor University Medical Center at Dallas, Dallas, TX; Cleveland Clinic, Cleveland, OH; Columbia University Medical Center/New York Presbyterian Hospital, New York, NY; Duke University Medical Center, Durham, NC; Froedtert & The Medical College of Wisconsin Community Physicians, Milwaukee, WI; Houston Methodist Lung Center, Houston, TX; Lahey Clinic, Burlington, MA; Loyola University Health System, Maywood, IL; Lynchburg Pulmonary Associates, Lynchburg, VA; Medical University of South Carolina, Charleston, SC; National Jewish Health, Denver, CO; NYU Medical Center, New York, NY; Piedmont Healthcare, Austell, GA; Pulmonary Associates of Stamford, Stamford, CT; PulmonIx LLC, Greensboro, NC; Renovatio Clinical, The Woodlands, TX; Salem Chest and Southeastern Clinical Research Center, Winston Salem, NC; South Miami Hospital, South Miami, FL; St. Joseph's Hospital, Phoenix, AZ; Stanford University, Stanford, CA; Temple University, Philadelphia, PA; The Oregon Clinic, Portland, OR; Tulane University, New Orleans, LA; UNC Chapel Hill, Chapel Hill, NC; University of Alabama at Birmingham, Birmingham, AL; University of California, Davis, Sacramento, CA; University of California Los Angeles, Los Angeles, CA; University of Chicago, Chicago, IL; University of Cincinnati Medical Center, Cincinnati, OH; University of Louisville, Louisville, KY; University of Miami, Miami, FL; University of Michigan, Ann Arbor, MI; University of Minnesota, Minneapolis, MN; University of Pennsylvania, Philadelphia, PA; University of Pittsburgh, Pittsburgh, PA; University of Virginia, Charlottesville, VA; UT Southwestern Medical Center, Dallas, TX; Vanderbilt University Medical Center, Nashville, TN; Vermont Lung Center, Colchester, VT; Wake Forest University, Winston Salem, NC; Washington University, St. Louis, MO; Weill Cornell Medical College, New York, NY; Wilmington Health and PMG Research, Wilmington, NC; Yale School of Medicine, New Haven, CT.

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