Longitudinal comparison of anxiety and depression between idiopathic pulmonary fibrosis and other interstitial lung diseases: a prospective cohort study

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Research

Keywords: Interstitial Lung Disease, Lung fibrosis, Quality of Life

Posted Date: June 19th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-36517/v1>

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Abstract

Background and objective:

Few studies have investigated the differences in the incidence of anxiety and depression among the interstitial lung diseases (ILDs). We evaluated the differences in the incidence of anxiety and depression between idiopathic pulmonary fibrosis (IPF) and non-IPF ILD, and the changes after a 1-year follow-up period.

Methods

The study participants were patients included in a prospective ILD cohort of Seoul National University Hospital between March 2013 and August 2018. Clinical variables were recorded at baseline and at 1 year. The Hospital Anxiety and Depression Scale was used to assess patient anxiety and depression at baseline and at 1-year follow-up.

Results

A total of 224 patients in the cohort participated in the study (154 [68.8%] with IPF and 70 [31.2%] with non-IPF ILD). Among them, 111 patients completed a follow-up Hospital Anxiety and Depression Scale questionnaire 1 year later (77 in the IPF group, 34 in the non-IPF group). In the IPF group, 20.8% and 27.3% of patients suffered from anxiety and 29.9% and 31.2% suffered from depression at baseline and 1-year follow-up, respectively. In the non-IPF group, 14.3% and 23.5% of patients suffered from anxiety and 24.3% and 17.6% suffered from depression at baseline and 1-year follow-up, respectively. Total score on the St. George's Respiratory Questionnaire at baseline was associated with depression both at baseline (odds ratio 1.05; 95% confidence interval 1.02–1.08) and at 1-year follow-up (odds ratio 1.03; 95% confidence interval 1.00–1.05), even after adjusting other factors. The interaction of prevalence change of anxiety and depression at baseline and 1-year follow-up between the IPF group and the non-IPF ILD group were not statistically significant (p-value 0.878 for anxiety and 0.376 for depression, respectively).

Conclusion

The prevalence of anxiety and depression at baseline and at 1-year follow-up were not significantly different between patients with IPF and non-IPF ILD. St. George's Respiratory Questionnaire total score at baseline was associated with depression at baseline and at 1-year follow-up.

Introduction

Many conditions fall under the category of interstitial lung disease (ILD). Idiopathic pulmonary fibrosis (IPF), the most common form of idiopathic interstitial pneumonia [1] is a specific form of chronic, progressive fibrosing ILD of unknown cause occurring in adults. The condition is associated with poor prognosis and a median survival of 2.5–3.5 years [2]. Treatment and prognosis of non-IPF ILD is different for each disease. Systemic steroid therapy is recommended to treat idiopathic nonspecific interstitial pneumonia, and 5-year survival has been reported to be greater than 70% [3–5]. Cryptogenic organizing pneumonia also has good response to systemic steroid therapy [6, 7]. Less than 5% of patients with cryptogenic organizing pneumonia progress to acute respiratory failure or death [8–10]. Connective tissue disease-associated ILD has various prognoses based on the causative connective tissue disease. Interstitial lung disease has been found to contribute about 13% to the excess mortality of patients with rheumatoid arthritis-related ILD (RA-ILD) compared with the general population [11]. The 10-year survival rate after diagnosis of systemic sclerosis-related ILD has been reported in the range of 29%–69%. In 45%–55% of patients, deterioration of pulmonary function is confirmed within the first 3 years, and about 16% of patients develop severe restrictive pulmonary disease [12]. The 5-year survival rate of Sjögren's syndrome-related ILD has been reported to be 84% [13].

Depression is more common in patients with chronic disease than in healthy people [14]. Anxiety and depression might be strengthened by the uncertain course of critical illness and a lack of clarity about the prognosis [15]. Therefore, anxiety and depression are common in patients with IPF or ILD. One recent study observed that about one-quarter of patients with IPF had depression and anxiety [16]. Dyspnea and comorbidity contribute to anxiety and depression in ILD [17]. Past studies have demonstrated that depression and anxiety are associated with health-related quality of life, health status, and reduced forced vital capacity (FVC); however, no significant differences have been found in survival rate and hospitalization [16, 18, 19]. One prospective study found that depressive symptoms in patients with ILD were persistent, and presence of depression at initial evaluation was the most powerful predictor of depression severity at follow-up [18]. However, anxiety had not been assessed in that study. Few studies have evaluated the differences in prevalences of anxiety and depression between patients with IPF and non-IPF ILD. In this study, we evaluated the prevalences of depression and anxiety in patients with IPF and non-IPF ILD and analyzed the changes in prevalence after 1 year, using a prospective cohort.

Methods

We recruited patients from the prospective ILD registry in Seoul National University Hospital in Korea between March 2014 and August 2018. All patients provided written informed consent. This study was approved by the Institutional Review Board and Ethics Committee of Seoul National University Hospital (number: NCT03238989). Among the patients of the ILD registry, those who completed the) at baseline and 1-year follow-up or at baseline were included in the analysis.

Idiopathic pulmonary fibrosis was diagnosed according to the 2011 consensus of the American Thoracic Society, European Respiratory Society, Japanese Respiratory Society, and Latin American Thoracic Association [2] and non-IPF ILD was defined as all ILDs except IPF. The HADS, which was a primary

outcome, was used to assess depression and anxiety. The questionnaire had been validated by several studies, and we used a validated Korean version [20–22]. The HADS consists of 14 questions; 7 questions on depression (HADS-D) and the other 7 on anxiety (HADS-A). Scores for each subscale range from 0 to 21.

Other study variables were as follows: age, sex, smoking history, comorbidity, St. George's Respiratory Questionnaire (SGRQ) score, modified Medical Research Council (mMRC) dyspnea scale score, six-minute walk test performance, FVC, diffusing capacity of the lungs for carbon monoxide (DLCO), and gender-age-physiology (GAP) index. Pulmonary function tests (FVC and DLCO) were carried out by trained technicians according to standardized American Thoracic Society guidelines [23]. The GAP index for each patient was calculated according to methods described by Ley, et al [24]. The SGRQ score, FVC, and DLCO were measured at the 1-year follow-up.

Continuous variables were compared using the independent Student's *t*-test, and categorical variables were compared using the Chi-square test. Logistic regression was used to identify the factors influencing the presence of anxiety or depression on baseline status. The generalized estimating equation was conducted to identify the factors affecting the presence of anxiety or depression, at baseline and the 1-year follow-up. Statistical analyses were performed using R version 3.4.4 (The R Foundation for Statistical Computing, Vienna, Austria, <https://www.r-project.org>). The level of significance was set at 0.05.

Results

Participant characteristics

Two-hundred fifty-three patients were recruited from the ILD registry. Twenty-three patients were excluded from the study due to incomplete HADS questionnaires. Six were excluded due to uncertainty of diagnosis. Therefore, the data of 224 patients were eligible for analysis at baseline. Of these 224 patients, 154 were diagnosed with IPF, and 70 were diagnosed with non-IPF ILD. In the patients with non-IPF ILD, there were 26 (37.1%) with connective tissue disease-related ILD, 11 with nonspecific interstitial pneumonia (15.7%), and 1 with cryptogenic organizing pneumonia (1.4%). One hundred eleven patients completed the HADS questionnaire 1 year after enrollment in the registry (at 1-year follow-up). Of these patients, 77 had IPF, and 34 had non-IPF ILD (Figure 1).

At baseline, there were 118 (76.6%) males in the IPF group and 31 (44.3%) males in the non-IPF ILD group. Average age in the IPF and non-IPF ILD groups were 71.4 ± 7.8 and 61.9 ± 14.1 , respectively. Compared with the IPF group, there were more patients in the non-IPF ILD group who had never smoked (56.7% vs. 30.5%). Comorbidities such as diabetes mellitus, hypertension, liver disease, history of pulmonary tuberculosis, gastrointestinal disease, brain vascular disease, articular disease, heart disease, and cancer were similar between the two groups. Compared with the non-IPF ILD group, SGRQ symptom scores were higher in the IPF group (41.9 ± 22.1 vs. 34.5 ± 20.5 , $p=0.02$). St. George's Respiratory Questionnaire activity scores (40.8 ± 28.4 and 36.9 ± 28.4 in IPF and non-IPF group, $p=0.34$), impacts

scores (21.3 ± 22.7 and 17.2 ± 19.8 , $p=0.203$), and total scores (31.2 ± 22.1 and 26.4 ± 20.6 , $p=0.133$) were not significantly different between the two groups. Compared with the non-IPF ILD group, the GAP index was higher in the IPF group (2.8 ± 1.3 vs. 1.9 ± 1.3 , $p<0.001$). Six-minute walk test performance (m) was 410.7 ± 108.6 and 434.1 ± 96.5 in the IPF and non-IPF groups, respectively, ($p=0.376$). Modified Medical Research Council dyspnea scale scores were not significantly different between the two groups. Forced vital capacity in liters (2.7 ± 0.8 and 2.6 ± 1.0 , $p=0.378$), FVC percent predicted (78.8 ± 17.1 and 80.6 ± 21.6 , $p=0.553$), and DLCO were also not significantly different between the two groups (Table 1).

Prevalences of anxiety and depression

Prevalences of anxiety and depression of patients with IPF at baseline and at 1 year were 20.9% (95% confidence interval [CI], 14.8-28.2), 29.9% (95% CI, 22.9-37.9), 27.3% (95% CI, 18.0-38.8), and 31.2% (95% CI, 21.4-42.9), respectively. In the non-IPF group, prevalences of anxiety and depression were 14.3% (95% CI, 7.4-25.2) and 24.3% (95% CI, 15.2-36.3), respectively, at baseline. One year after, the prevalences of anxiety and depression in the non-IPF group were 23.5% (95% CI, 11.4-41.6) and 17.7% (95% CI, 7.4-35.2), respectively (Table 2).

The prevalence of anxiety increased after 1 year in both the IPF and non-IPF ILD groups, and the p-value for interaction was 0.878. The prevalence of depression in the non-IPF ILD group decreased after 1 year, and the difference in prevalence between the IPF group and non-IPF ILD group increased; however, the p-value for interaction was 0.376 (Figure 2).

Factors associated with anxiety and depression

At baseline, whether the patient had been diagnosed with IPF or non-IPF ILD was not associated with anxiety and depression (odds ratio [OR] 1.65; 95% CI 0.71-3.88 in anxiety; OR 1.27; 95% CI 0.64-2.53 in depression). This finding was the same even after sex, age, whether the patient had been diagnosed with IPF or non-IPF ILD, SGRQ total score at baseline, FVC percent predicted at baseline, DLCO percent predicted at baseline, mMRC dyspnea scale score, and six-minute walk test performance were adjusted (OR 1.72; 95% CI 0.64-4.63 in anxiety; OR 1.18; 95% CI 0.52-2.70 in depression). St. George's Respiratory Questionnaire total score at baseline was significantly associated with anxiety and depression at baseline after adjusting the above-mentioned factors (OR 1.72; 95% CI 1.01-1.05 in anxiety; OR 1.04; 95% CI 1.02-1.06 in depression) (Table 3). Whether the patient had been diagnosed with IPF or non-IPF ILD was not associated with anxiety and depression after 1 year (OR 1.48; 95% CI 0.54-4.10 in anxiety; OR 1.69; 95% CI 0.64-4.50 in depression). Only SGRQ total score at baseline was associated with depression after 1 year, after adjusting for sex, age, whether the patient had been diagnosed with IPF or non-IPF ILD, FVC percent predicted at baseline, DLCO percent predicted at baseline, mMRC dyspnea scale score at baseline, and 6-minute walk test performance at baseline (OR 1.03; 95% CI 1.00-1.05) (Table 4).

Discussion

In this study, prevalences of anxiety and depression at baseline were 20.8% and 29.9% in the IPF group, and 14.3% and 24.3% in the non-IPF ILD group, respectively. At 1-year follow-up, prevalences of anxiety and depression at baseline were 27.3% and 31.2% in the IPF group, and 23.5% and 17.6% in the non-IPF ILD group. St. George's Respiratory Questionnaire total score at baseline was associated with anxiety and depression at baseline and depression at 1-year follow-up. The proportion of patients with depression in the non-IPF ILD group decreased slightly from baseline to 1-year follow-up. However, the difference in the change in prevalence of depression between the IPF group and the non-IPF ILD group at 1-year follow-up was not statistically significant.

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, the diagnostic criteria for depression are mood swings, marked irritability or anger, decreased interest in usual activities, etc. Anxiety refers to the anticipation of future threat. This mood state is associated with muscle tension and vigilance in preparation for future danger and cautious or avoidant behaviors [25].

Psychological symptoms are associated with disease progress in severe COPD [26]. Depression negatively impacts patient quality of life by decreasing treatment compliance [27]. Idiopathic pulmonary fibrosis is associated with poor prognosis; therefore, anxiety and depression are common in patients with IPF [18, 19]. The prevalences of anxiety and depression in patients with IPF in the present study were similar to those in other studies [28]. However, there were no significant differences in the prevalences of anxiety and depression between patients with IPF and patients with non-IPF ILDs.

Dyspnea and depression influence one another. Depressive symptoms are caused by dyspnea, and the awareness of dyspnea is worsened by depressive symptoms [18]. Some depressive symptoms, such as dyspnea, fatigue, appetite, sleep, and concentration, can overlap with pulmonary symptoms [29]. In the present study, there were no significant differences in mMRC dyspnea scale score and six-minute walk test performance between the IPF group and non-IPF ILD group (Table 1). Moreover, mMRC dyspnea scale score and six-minute walk test performance were associated with anxiety and depression independently of whether the patient had been diagnosed with IPF or non-IPF ILD (data not shown). This finding indicates that anxiety and depression were related to dyspnea in all ILD patients.

Depression has been found to be significantly associated with health-related quality of life [19]. The present study demonstrated that anxiety is influenced by health-related quality of life, as measured by the SGRQ, in both patients with IPF and patients with non-IPF ILD. Although the SGRQ was not specifically developed for use in patients with IPF, its psychometric properties have been determined to be adequate, and it can be a useful measure of health-related quality of life in these patients [30]. The SGRQ total score at baseline was found to be related to anxiety and depression at baseline in both groups. Our study suggests that the SGRQ can also aid in the psychometric testing of patients with non-IPF ILD.

In one study, it was observed that the tendencies toward anxiety and depression were maintained over 1 year [31]. In another study on the impact of palliative care in patients with IPF, depression increased from baseline to the 3- and 6-month follow-ups [32]. In our study, the prevalence of anxiety increased in both groups, and the prevalence of depression increased in the IPF group but decreased in the non-IPF

ILD group from baseline to 1-year follow-up. Whether the patient had been diagnosed with IPF or non-IPF ILD was not found to be associated with anxiety and depression after 1-year follow-up. The changes in prevalence of anxiety and depression after 1 year were not significantly different between the IPF and non-IPF ILD groups; the p-value for interaction was 0.878 and 0.376 in anxiety and depression, respectively (Fig. 2). Dyspnea was found to be associated with persistent anxiety and depression in both groups over 1 year in the univariate analysis but not in multivariate analysis. It was similar results with other study [31]. In the present study, SGRQ total score at baseline was related to depression at baseline and at 1-year follow-up, regardless of whether patients had IPF or non-IPF ILD. Interstitial lung disease has a long-term effect on health-related quality of life. Therefore, it is important to comprehensively evaluate patients with ILD.

One previous study demonstrated that depression and anxiety were not related to prognosis in patients with IPF [16]. The role of palliative care in patients with IPF is unclear [32, 33]. The present study included not only patients with IPF, but also patients with non-IPF ILDs. In addition, the patients were followed up prospectively for 1 year. However, a 1-year period is a relatively short amount of time to investigate changes in anxiety and depression in patients with ILD. Further studies that evaluate the changes in and impact of anxiety and depression on clinical outcomes in patients with ILD are warranted.

Conclusion

Anxiety and depression were commonly observed in patients with ILD. The prevalences of anxiety and depression at baseline and at 1-year follow-up were not significantly different between patients with IPF and patients with non-IPF ILD. Quality of life at baseline was associated with depression at baseline and at 1-year follow-up, regardless of whether the patient had been diagnosed with IPF or non-IPF ILD.

Abbreviations

DLCO: Diffusing capacity of the lungs for carbon monoxide; FVC: Forced vital capacity; GAP: Gender-age-physiology; HADS: Hospital anxiety and depression scale; ILD: Interstitial lung disease; IPF: Idiopathic pulmonary fibrosis; mMRC: Modified medical research council; RA-ILD: Rheumatoid arthritis-related ILD; SGRQ: St. George's respiratory questionnaire.

Declarations

Ethics approval and consent to participate

All patients provided written informed consent. This study was approved by the Institutional Review Board and Ethics Committee of Seoul National University Hospital (number: NCT03238989).

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Consent for publication

Not applicable

Competing interests

The authors declare that they have no competing interests

Funding

The authors have reported that no funding was received for this study.

Authors' contributions

All authors had full access to the data in this study and take complete responsibility for the integrity of the data and accuracy of the data analysis. Sun Mi Choi designed the study, data interpretation, and provided critical review and revision of the manuscript for intellectual content. Won Bae contributed to statistical analysis, data interpretation and drafted the initial manuscript. Chang-Hoon Lee conducted to statistical analysis and contributed to the study design, data interpretation, and provided critical review and revision of the manuscript for intellectual content. Jaeyoung Cho, Jinwoo Lee, Young Sik Park, Sang-Min Lee, Chul-Gyu Yoo and Young Whan Kim conducted to data interpretation and study supervision. All the authors approved the final manuscript as submitted.

Acknowledgements

Not applicable

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Tables

Table 1. Baseline characteristics of the participants

	Diagnosis		P-value
	IPF (n=154)	Non-IPF ILD (n=70)	
Male	118 (76.6%)	31 (44.3%)	<0.001
Age	71.4 ± 7.8	61.9 ± 14.1	<0.001
Smoking status			<0.001
current	9 (6.0%)	8 (11.9%)	
ex	96 (63.6%)	21 (31.3%)	
never	46 (30.5%)	38 (56.7%)	
DM	44 (28.9%)	12 (17.6%)	0.107
HTN	58 (37.9%)	15 (22.1%)	0.031
Liver disease	16 (10.5%)	7 (10.3%)	0.999
History of pulmonary TB	20 (13.1%)	8 (11.8%)	0.96
GI disease	20 (13.1%)	10 (14.7%)	0.332
Brain vascular disease	2 (1.3%)	2 (2.9%)	0.768
Articular disease	14 (9.2%)	7 (10.3%)	0.985
Heart disease	19 (12.4%)	12 (17.6%)	0.41
Cancer	10 (6.7%)	5 (7.4%)	0.999
SGRQ score			
Symptom	41.9 ± 22.1	34.5 ± 20.5	0.02
Activity	40.8 ± 28.4	36.9 ± 28.4	0.34
Impacts	21.3 ± 22.7	17.2 ± 19.8	0.203
Total	31.2 ± 22.1	26.4 ± 20.6	0.133
GAP score	2.8 ± 1.3	1.9 ± 1.3	<0.001
GAP stage			0.225
1	108 (74.0%)	51 (85.0%)	
2	34 (23.3%)	9 (15.0%)	
3	4 (2.7%)	0	
6-minute walk test (m)	410.7 ± 108.6	434.1 ± 96.5	0.376
mMRC dyspnea scale			0.103
0	36 (23.8%)	22 (32.4%)	
1	72 (47.7%)	33 (48.5%)	
2	38 (25.2%)	8 (11.8%)	
3	5 (3.3%)	5 (7.4%)	
FVC (liter)	2.7 ± 0.8	2.6 ± 1.0	0.378
FVC (pred, %)	78.8 ± 17.1	80.6 ± 21.6	0.553
DLCO	11.9 ± 10.5	12.0 ± 4.5	0.879
DLCO (pred, %)	64.1 ± 19.4	62.9 ± 18.2	0.684

DM = diabetes mellitus; FVC (liter) = forced vital capacity in liters; FVC (pred %) = forced vital capacity percent predicted; GAP = gender-age-physiology; GI = gastrointestinal; HTN = hypertension; ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis; mMRC = modified Medical Research Council dyspnea scale; SGRQ = St. George's Respiratory Questionnaire; TB = tuberculosis.

Continuous data are presented as mean ± SD, and categorical data are presented as number (%).

Table 2. Prevalence of anxiety and depression

	Anxiety				Depression			
	IPF		Non-IPF ILD		IPF		Non-IPF ILD	
	Prevalence*	95% CI	Prevalence*	95% CI	Prevalence*	95% CI	Prevalence*	95% CI
Baseline	20.9	14.8-28.2	14.3	7.4-25.2	29.9	22.9-37.9	24.3	15.2-36.3
1 year	27.3	18.0-38.8	23.5	11.4-41.6	31.2	21.4-42.9	17.7	7.4-35.2

CI = confidence interval; ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis.

*Prevalence is expressed as %.

Table 3. Factors associated with anxiety and depression at baseline

	Anxiety		Depression	
	Unadjusted OR (95% CI)	Adjusted OR* (95% CI)	Unadjusted OR (95% CI)	Adjusted OR* (95% CI)
Sex	1.30 (0.58-2.89)	1.36 (0.54-3.41)	1.01 (0.52-1.96)	1.36 (0.59-3.15)
Age	0.99 (0.96-1.03)	0.64 (0.25-1.64)	1.00 (0.97-1.02)	0.86 (0.37-2.03)
IPF vs. non-IPF ILD	1.65 (0.71-3.88)	1.52 (0.57-4.06)	1.27 (0.64-2.53)	1.05 (0.45-2.46)
SGRQ total score	1.02 (1.01-1.04)	1.03 (1.01-1.05)	1.04 (1.02-1.06)	1.05 (1.02-1.08)
FVC % predicted	0.99 (0.97-1.01)	1.01 (0.98-1.03)	0.98 (0.96-1.00)	1.01 (0.98-1.03)
DLCO % predicted	0.99 (0.97-1.01)	1.01 (0.98-1.04)	0.99 (0.97-1.01)	1.00 (0.98-1.03)
mMRC	1.61 (1.03-2.51)	0.83 (0.42-1.63)	1.83 (1.22-2.73)	0.65 (0.34-1.25)
6-minute walk test	1.00 (0.99-1.00)	1.00 (0.99-1.00) [†]	0.99 (0.99-1.00)	1.00 (0.99-1.00) [‡]

DLCO = diffusing capacity of the lungs for carbon monoxide; FVC (pred %) = forced vital capacity percent predicted; ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis; mMRC = modified Medical Research Council dyspnea scale; SGRQ = St. George's Respiratory Questionnaire.

*Adjusted by sex, age, IPF vs. non-IPF ILD, SGRQ total score at baseline, FVC % predicted at baseline, DLCO % predicted, mMRC grade, and 6-minute walk test performance at baseline.

[†] $p=0.053$; [‡] $p=0.103$

Table 4. Factors associated with anxiety and depression at 1-year follow-up

	Anxiety		Depression	
	Unadjusted OR (95% CI)	Adjusted OR* (95% CI)	Unadjusted OR (95% CI)	Adjusted OR* (95% CI)
Sex	0.85 (0.43-1.68)	0.82 (0.35-1.91)	1.06 (0.55-2.02)	1.13 (0.52-2.47)
Age	0.84 (0.42-1.70)	0.74 (0.31-1.77)	0.89 (0.46-1.73)	0.66 (0.27-1.60)
IPF vs. non-IPF ILD	1.49 (0.70-3.20)	1.48 (0.54-4.10)	1.93 (0.91-4.09)	1.69 (0.64-4.50)
SGRQ total score at baseline	1.03 (1.01-1.05)	1.02 (1.00-1.04)*	1.03 (1.02-1.05)	1.03 (1.00-1.05) [†]
FVC % predicted at baseline	0.98 (0.96-1.00) [‡]	0.99 (0.97-1.02)	0.98 (0.96-1.00) [§]	1.00 (0.98-1.02)
DLCO % predicted at baseline	0.98 (0.96-0.99)	1.00 (1.00-1.00)	0.98 (0.96-1.00)	1.00 (0.97-1.02)
mMRC at baseline	1.98 (1.22-3.23)	1.25 (0.60-2.61)	2.22 (1.43-3.45)	1.29 (0.58-2.61)
6-minute walk test at baseline	1.00 (0.99-1.00) [¶]	1.00 (0.99-1.00)	1.00 (0.99-1.00) ^{**}	1.23 (0.58-2.61)

DLCO = diffusing capacity of the lungs for carbon monoxide; FVC (pred %) = forced vital capacity percent predicted; ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis; mMRC = modified Medical Research Council dyspnea scale; SGRQ = St. George's Respiratory Questionnaire.

*Adjusted by sex, age, IPF vs. non-IPF ILD, SGRQ total score at baseline, FVC % predicted at baseline, DLCO % predicted, mMRC grade, and 6-minute walk test performance at baseline.

* $p=0.061$; [†] $p=0.031$; [‡] $p=0.05$; [§] $p=0.047$; ^{||} $p=0.02$; [¶] $p=0.086$; ^{**} $p=0.016$

Figures

Figure 1

Study flow chart *Non-IPF ILD were connective tissue disease-related interstitial lung disease 26 (37.1%), nonspecific interstitial pneumonia 11 (15.7%), cryptogenic organizing pneumonia 1 (1.4%), other 32 (45.7%). Connective tissue disease were Sjögren’s syndrome 8 (30.8%), rheumatic arthritis 6 (23.1%), dermatomyositis 5 (19.2%), systemic sclerosis 2 (7.7%), systemic lupus erythematosus 1 (3.8%), undifferentiated connective tissue disease 2 (7.7%), mixed connective tissue disease 1 (3.8%) and undiagnosed 1 (3.8%). HADS = Hospital Anxiety and Depression Scale; ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis.

Figure 2

Prevalence change at 1-year follow-up A) Anxiety B) Depression ILD = interstitial lung disease; IPF = idiopathic pulmonary fibrosis.