**Table 1 Chest HRCT scoring criteria**

|  |  |
| --- | --- |
| Score | Lesions and lung segments |
| Severity score | Parenchymal abnormalities |
|  1 | Ground glass opacities |
|  2 | Irregularities in the pleural margins |
|  3 | Septal/ Subpleural lines |
|  4 | Honeycombing |
|  5 | Subpleural cysts |
| Extent score | Number of lung segments |
|  1 |  1-3 |
|  2 |  4-9 |
|  3 |  >9 |

HRCT score = severity score + extent score (0-30). HRCT: high resolution computed tomography.

**Table 2 Cough symptom scoring criteria**

|  |  |  |
| --- | --- | --- |
| Score | Daytime cough symptom score | Night-time cough symptom score |
| 0 | no cough during the day | no cough during the night  |
| 1 | cough for infrequent short periods | short cough when falling asleep/infrequent nocturnal cough |
| 2 | frequent coughing, which did interfere with usual daytime activities | mildly interfere with nocturnal sleep due to coughs |
| 3 | frequent coughing, which did severely interfere with usual daytime activities | severely interfere with nocturnal sleep due to coughs  |

Total cough symptom score = Daytime cough symptom score + Night-time cough symptom score

**Table 3 Patient general clinical data**

|  |  |  |  |
| --- | --- | --- | --- |
|  | IPF (n=23) | CTD-ILD (n=21) | Control (n=30) |
| Men/women (ratio) | 21/2 (10.5:1) \* | 7/14 (1:2) | 14/16 |
| Age (mean ± SD), year | 62 ± 8 | 60 ± 11 | 61 ± 9 |
| Smoker, n (%) | 17 (73.9) \* | 3 (14.3) | 5 (16.7) |
| Disease duration (mean ± SD),week | 28 ± 21 | 21 ± 21 | NA |
| CRP (mg/L) | 7.5 ± 11.3 | 8.0 ± 11.1 | NA |
| ESR (mm/h) | 32 ± 23 | 28 ± 19 | NA |
| PaO2 (mmHg) | 80.5 ± 15.2 | 84.1 ± 11.3 | NA |
| PaCO2 (mmHg) | 39.0 ± 3.8 | 39.7 ± 2.5 | NA |
| SaO2 (%) | 95.1 ± 5.1 | 96.3 ± 2.1 | NA |
| FVC (L) | 2.15 ± 0.90 | 1.94 ± 0.75 | NA |
| FVC, % pred | 76.5 ± 28.2 | 65.1 ± 18.7 | NA |
| DLCO, % pred | 58.2 ± 26.6 | 56.7 ± 24.6 | NA |
| Chest HRCT score | 17.5 ± 7.6 | 16.1 ± 7.5 | NA |
| Daytime cough symptom score | 1.26 ± 0.45 | 1.24 ± 0.44 | NA |
| Nighttime cough symptom score | 0.65 ± 0.57 | 0.81 ± 0.68 | NA |
| Total cough symptom score | 1.91 ± 0.90 | 2.05 ± 0.97 | NA |

Control: healthy individuals. IPF = idiopathic pulmonary fibrosis, CTD-ILD = connective tissue disease-related interstitial lung disease, CRP = c-reactive protein, ESR = erythrocyte sedimentation rate, PaO2 = partial pressure of oxygen, PaCO2 = partial pressure of carbon dioxide, SaO2 = oxygen saturation, FVC = force vital capacity, FVC % pred = force vital capacity expressed as a percentage of predicted, DLCO % pred = carbon monoxide diffusing capacity of the lung expressed as a percentage of predicted, NA = not applicable, SD = standard deviation.

\* Represent significant difference of the IPF group versus the CTD-ILD group and control group, *P* < 0.01.

**Table 4 Proportions of patients in different pH groups**

|  |  |  |  |
| --- | --- | --- | --- |
|  | pH < 6.5, n (%) | pH 6.5-7.5, n (%) | pH > 7.5, n (%) |
| Entire pH monitoring duration |
| Control, n = 30 | 1 (3.3) | 28 (93.4) | 1 (3.3) |
| Total, n = 44 | 5 (11.4) | 27 (61.3) | 12 (27.3)\* |
|  IPF, n = 23 | 2 (8.7) | 16 (69.6) | 5 (21.7) |
|  CTD-ILD, n = 21 | 3 (14.3) | 11 (52.4) | 7 (33.3) |
| At upright position |
| Control, n = 30 | 1 (3.3) | 28 (93.4) | 1 (3.3) |
| Total, n = 44 | 3 (6.8) | 28 (63.6) | 13 (29.6)\* |
|  IPF, n = 23 | 0 (0) | 18 (78.3) | 5 (21.7) |
|  CTD-ILD, n = 21 | 3 (14.3) | 10 (47.6) | 8 (38.1) |
| At supine position |
| Control, n = 30 | 1 (3.3) | 27 (90.0) | 2 (6.7) |
| Total, n = 44 | 12 (27.3)\* | 24 (54.5) | 8 (18.2) |
|  IPF, n = 23 | 8 (34.8) | 12 (52.2) | 3 (13) |
|  CTD-ILD, n = 21 | 4 (19.1) | 12 (57.1) | 5 (23.8) |

Control: healthy individuals. IPF = idiopathic pulmonary fibrosis, CTD-ILD = connective tissue disease-related interstitial lung disease.

\* Represent significant difference of the ILD group versus the control group, *P* < 0.01.

**Table 5 Seven patients showing abnormal Ryan index score**

|  |  |  |  |
| --- | --- | --- | --- |
| Patient No. | Disease | Ryan index score  |  |
| At the upright position | At the supine position\* |
| 1 | IPF | 65.33 | 2.17 |
| 2 | CTD-ILD | 11.5 | 2.17 |
| 3 | IPF | 59.82 | 2.17 |
| 4 | IPF | 11.91 | 2.17 |
| 5 | CTD-ILD | 32.15 | 2.17 |
| 6 | IPF | 17.5 | 2.17 |
| 7 | IPF | 23.91 | 2.17 |

IPF = idiopathic pulmonary fibrosis, CTD-ILD = connective tissue disease-related interstitial lung disease.

\*When Ryan index score at the supine position was < 6.79, the results from the calculation by the software were presented as 2.17.

**Table 6 Five patients showing significant changes in pH values at coughing**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Patient No. | Disease | Overall average pH | Average pH at coughing | *P* value |
| 1 | CTD-ILD | 7.6083±0.2953 | 7.6992±0.1093 | 0.015 |
| 2 | CTD-ILD | 7.1698±0.4367 | 7.4450±0.3122 | 0.021 |
| 3 | CTD-ILD | 6.7369±0.3188 | 7.0700±0.1950 | 0.009 |
| 4 | IPF | 7.3443±0.2719 | 7.5490±0.1906 | 0.008 |
| 5 | IPF | 6.8064±0.4245 | 5.8867±0.3667 | 0.049 |

IPF = idiopathic pulmonary fibrosis, CTD-ILD = connective tissue disease-related interstitial lung disease