Idiopathic pulmonary fibrosis (IPF) is associated with progressive dyspnoea, deterioration of pulmonary function and serious limitation of physical activities with major impact on quality of life.

Methods

Prospective, open-label, single-arm, single-centre observational study (NCT 03544598). Usual care throughout.

Patients were invited to participate at routine visits to their nurse-led IPF clinic. pMp was installed on patients’ smart phone & SpirioKit Smart Spirometer supplied at baseline. Patients were asked to record FVC (best at home once/day & pMp once/week on pMp until next planned clinic visit). Patients could also record other data (e.g. mMRC score, symptoms, oximetry, medicines adherence, steps/day). Spirometry, mMRC score and PROM were assessed at clinic at baseline and end of study.

Table 1: Baseline Demographics

<table>
<thead>
<tr>
<th>Variable</th>
<th>n</th>
<th>Mean ± SD</th>
<th>Median (Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (y)</td>
<td>20</td>
<td>56 ± 14</td>
<td>56 (37-70)</td>
</tr>
<tr>
<td>Gender</td>
<td>20</td>
<td>10M 10F</td>
<td></td>
</tr>
<tr>
<td>mMRC score</td>
<td>20</td>
<td>3.30 ± 0.74</td>
<td>3 (1-4)</td>
</tr>
<tr>
<td>FVC predicted (%; mean ± SD)</td>
<td>20</td>
<td>92% ± 17%</td>
<td>92 (66.6-100)</td>
</tr>
</tbody>
</table>

Anti-fibrotic therapy (n): none 1, pirfenidone 8, nintedanib 11

Baseline scores (assessed in clinic) characterised the impact of IPF across all PROM domains (psychological & physical impact of dyspnoea, psychological well being & fatigue). Two patients had a decrease in clinic FVC over the duration of the study (decrease of 10% and 32% vs. baseline respectively). All other patients had no significant change in clinic FVC (decreases ≤10%). Changes in mMRC score were not statistically significant.

Correlation between patient-recorded and in-clinic FVC was calculated for the mean of the first 7 days after baseline and separately for the last 7 days before the end-of-study date (using the bootstrapping method).

Results

20 patients were enrolled, installed pMp and provided at least one home spirometry reading. Baseline demographics are shown in Table 1.

Baseline scores (assessed in clinic) characterised the impact of IPF across all PROM domains (psychological & physical impact of dyspnoea, psychological well being & fatigue).

The duration of follow-up was median 116 days (range 75-154). Patients recorded home spirometry on a median of 86 days (range 19-141) [median proportion of study days with home spirometry = 81% (range 14-99%)]. A heat map showing recording of home spirometry per day per patient is shown in Figure 1.

Generally, patient-recorded FVC values were within ±15% of the baseline in-clinic FVC value and were generally lower than in-clinic FVC values. For some patients, home spirometry values were highly variable and did not provide a reliable estimate of FVC. Figure 2 shows a plot of all patient-recorded FVC values versus time for a single patient.

Figure 2: FVC versus time for a single patient

Figure 3: Responses to patient questionnaire on utility and acceptability

Conclusions

IPF patients may wish to use a digital platform (like patientMpower) to record spirometry, symptoms and outcomes as part of usual care. Patients are willing to record data regularly.

Daily home spirometry was feasible and acceptable for most patients over the timeframe of this study.

In general, FVC measured at home spirometry provides a reliable estimate of lung function but attention is needed to ensure good home spirometry technique in all patients.

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