Understanding symptoms variability in outpatients with AECOPD

Dear Editor,

Symptoms are the cornerstone for diagnosing acute exacerbations of chronic obstructive pulmonary disease (AECOPD), however little information is available on their variability during these events and on their relationships with objective clinical measures. This study explored changes in patients’ symptoms and their relationships with objective clinical measures during AECOPD.

Methods

A longitudinal observational study was conducted with thirty-six outpatients with AECOPD (24 males; 68.4 ± 9.9 years; forced expiratory volume in one second (FEV₁) 50.7 ± 20.4% predicted) recruited from the urgent care of a Central hospital. Patients attended to 4 assessments: until 48 hours of the urgent care visit (T1), 8 days (T2), 15 days (T3) and 45 days (T4) after the hospital visit. Patients’ prescriptions included only pharmacological treatment and consisted in antibiotics (n=16; 44.4%), beta-adrenergic agonists (n=2; 5.6%), cholinergic antag-

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at doi:10.1016/j.pulmoe.2018.09.005.

Referências


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onists (n=3; 8.3%), associations of bronchodilators with cholinergic antagonists (n=7; 19.4%), anti-inflammatory drugs (n=1; 2.8%), xanthines (n=1; 2.8%) and expectorants (n=6; 16.7%).

Activities-related dyspnoea (modified British Medical Research Council questionnaire – mMRC), dyspnoea and fatigue at rest (modified Borg Scale – MBS), cough, sputum and wheezing symptoms (11-point numerical scale) were registered in each assessment. FEV₁, using a portable spirometer, and quadriiceps muscle strength (QMS), using a handheld dynamometer, were also collected.

The number of participants presenting symptoms, the severity of symptoms, FEV₁ and QMS were compared among T1, T2, T3 and T4 using the Cochran or Friedman tests, respectively. Changes in symptoms were correlated with changes in FEV₁ and QMS using the Spearman’s correlation coefficient.

Results

Dyspnoea and cough were the most reported symptoms at the onset of AECOPD. The number of patients with dyspnoea at rest, assessed with the MBS (MBS>0), decreased significantly from T1 to T4 (22 vs. 16 vs. 15 vs. 13; p=0.040) (Table 1). No significant differences were observed in the number of patients presenting activities-related dyspnoea, fatigue at rest, cough, sputum and wheezing symptoms. During the time course of the AECOPD, participants presented significantly more i) activities-related dyspnoea in T1, than in T3 (p=0.001) and T4 (p=0.028); ii) dyspnoea at rest in T1 than in T4 (p=0.016); iii) cough in T1 than in T2 (p=0.001), T3 (p=0.001) and T4 (p=0.001) and iii) wheezing in T1 than in T4 (p=0.022) (Table 1).

Changes occurring between T1 and T3 in mMRC correlated inversely with changes in QMS (rs=-0.41; p=0.013) whilst changes in cough (rs=0.47; p=0.021) correlated positively with QMS. Changes in MBS – dyspnoea (rs=-0.47; p=0.004) and fatigue (rs=-0.34; p=0.046) correlated inversely with changes in FEV₁ (Fig. 1). No further correlations were found.

Discussion

Dyspnoea and cough were the most reported symptoms at the onset of AECOPD. Dyspnoea was the most prevalent symptom. Its time-recovery matched previous reports (i.e., 6 to 30 days) whilst the timing of improvement differs, which may explain the positive correlation found between changes at T3-T1 between these two outcomes. Studies describing the pattern of QMS recovery in outpatients with AECOPD are needed to confirm these results and aid developing timely and personalised interventions.

Despite the novel findings in symptoms behaviour during AECOPD, this study has some limitations that need to be acknowledged. Treatment of exacerbations was not standardised, but rather prescribed according to the physician best judgment. Although the effects of therapies were not of interest in this study, it must be acknowledged that different combination of treatments might influence the recovery times and outcomes of individual patients. Characterisation of symptoms lack other important features, such as sputum purulence. These data can contribute to infer about the nature of the AECOPD (i.e., infective - viral and/or bacterial - or non-infective) and about the suitability of treatments prescribed. It is thus recommended to add sputum purulence to data collection in future study protocols.

In sum, this study showed that: i) dyspnoea is the most representative symptom at the onset of an AECOPD; ii) severity of cough is the first symptom to improve during the course of an AECOPD, and iii) changes in symptoms were correlated with FEV₁ and QMS, which are predictors of COPD hospitalisations and mortality. Our findings evi-
Table 1  Clinical variables and symptoms variability during the course of an AECOPD.

<table>
<thead>
<tr>
<th>AECOPD (T1)</th>
<th>8 days (T2)</th>
<th>15 days (T3)</th>
<th>45 days (T4)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEV\textsubscript{1}, L</td>
<td>0.9 [0.7-1.4]</td>
<td>0.9 [0.7-1.3]</td>
<td>1.1 [0.7-1.6]</td>
<td>1.2 [0.8-1.6]</td>
</tr>
<tr>
<td>No. patients (mMRC&gt;0)</td>
<td>35</td>
<td>31</td>
<td>32</td>
<td>30</td>
</tr>
<tr>
<td>mMRC</td>
<td>2.0 [2.0-3.0]</td>
<td>2.0 [2.0-2.8]</td>
<td>2.0 [1.0-2.0]*</td>
<td>1.5 [1.0-2.0]*</td>
</tr>
<tr>
<td>No. patients (MBS.d&gt;0)</td>
<td>22</td>
<td>16</td>
<td>15</td>
<td>13*</td>
</tr>
<tr>
<td>MBS - dyspnoea</td>
<td>3.0 [0.0-4.0]</td>
<td>0.0 [0.0-2.8]</td>
<td>0.0 [0.0-2.8]</td>
<td>0.0 [0.0-1.8]*</td>
</tr>
<tr>
<td>No. patients (MBS.f&gt;0)</td>
<td>17</td>
<td>15</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>MBS - fatigue</td>
<td>0.0 [0.0-3.0]</td>
<td>0.0 [0.0-3.0]</td>
<td>0.0 [0.0-3.0]</td>
<td>0.0 [0.0-2.0]</td>
</tr>
<tr>
<td>No. patients (NS.cough&gt;0)</td>
<td>24</td>
<td>23</td>
<td>21</td>
<td>23</td>
</tr>
<tr>
<td>Cough</td>
<td>8.0 [6.0-10.0]</td>
<td>4.0 [2.0-5.0]*</td>
<td>3.0 [2.0-5.0]*</td>
<td>2.0 [0.0-4.0]*</td>
</tr>
<tr>
<td>No. patients (NS.sputum&gt;0)</td>
<td>22</td>
<td>23</td>
<td>21</td>
<td>24</td>
</tr>
<tr>
<td>Sputum</td>
<td>5.0 [2.0-7.5]</td>
<td>3.0 [1.5-6.0]</td>
<td>3.0 [2.0-4.0]</td>
<td>2.0 [0.5-5.0]</td>
</tr>
<tr>
<td>No. patients (NS.wheezeing&gt;0)</td>
<td>20</td>
<td>21</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>Wheezing</td>
<td>6.0 [2.5-10.0]</td>
<td>4.0 [1.0-8.0]</td>
<td>3.0 [0.0-5.5]</td>
<td>2.0 [0.0-4.0]*</td>
</tr>
</tbody>
</table>

Legend: Values are shown as number or median [interquartile range]; significant difference at p<0.05; * different from T1.

FEV\textsubscript{1}, forced expiratory volume in one second; mMRC, modified British Medical Research Council questionnaire; MBS.d, modified Borg scale – dyspnoea; MBS.f, modified Borg scale – fatigue; NS, numerical scale; QMS, quadriceps muscle strength.

Figure 1  Correlations between changes from T1 to T3 in A) modified Borg scale – dyspnoea (MBS.d) and forced expiratory volume in 1 second (FEV\textsubscript{1}); B) modified Borg scale – fatigue (MBS.f) and FEV\textsubscript{1}; C) modified British Medical Research Council questionnaire (mMRC) and quadriceps muscle strength (QMS); D) Cough, assessed with the numerical scale, and QMS.


dence that timely management of symptoms is essential for patients’ recovery and should encourage health professionals to perform a comprehensive evaluation of outpatients with AECOPD using both patients reported symptoms and objective clinical outcome measures.

Conflict of interest statement

The authors declare no conflicts of interest.

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Referências


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