
CASE REPORT

Assessment of adherence to practice guidelines for managing exacerbation of chronic obstructive pulmonary disease in the emergency department

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RECEIVED:

22-3-2011

ACCEPTED:

22-8-2011

CONFLICT OF INTEREST:

None

This study aimed to describe clinical practice in terms of the degree of adherence to practice guidelines for managing chronic obstructive pulmonary disease (COPD) in a hospital emergency department. We reviewed the records of 352 patients with COPD treated over a period of 1 year. Blood pressure was recorded in 92% of the cases, heart rate in 74.7%, respiratory frequency in 71.9%, arterial blood oxygen saturation in 88.4%, the presence of breathlessness at rest in 25.3%, and accessory muscle recruitment in 13.4%. In cases for which it was possible to assess antibiotic therapy, these drugs were administered without adherence to guideline indications in 78.2%, and only 117 of the 215 patients (54%) with serious exacerbation received systemic corticosteroids. We conclude that the records reveal low adherence to recommendations for recording the signs required to apply practice guidelines for the management of COPD. It is therefore necessary to find tools that improve adherence to the recommended clinical pathways. [Emergencias 2012;24:296-299]

Key words: Chronic obstructive pulmonary disease (COPD), exacerbation. Practice guidelines as topic. Emergency health services.

Introduction

Chronic obstructive pulmonary disease (COPD) is a process characterized by poorly reversible and progressive chronic obstruction of airflow associated with an anomalous inflammatory reaction mainly to tobacco smoke^{1,2}. The IBERPOC Study³ of COPD in Spain demonstrated that 9.1% of the population aged 40-70 years had airflow obstruction, with 22% of patients having a previous diagnosis. The Epidemiologic Study of COPD in Spain (EPI-SCAN)⁴ showed a prevalence of 10.2% (15.1% in men and 5.6% in women), and 27% of cases had a previous diagnosis.

The chronic course of COPD is complicated by exacerbations, defined as acute changes in the patient's baseline clinical condition beyond daily variability, with increased dyspnea, expectoration and/or purulent sputum, or any combination of the three, and who require therapeutic

change. Patients present 1 to 3 episodes of exacerbation per year⁵, and between 3% and 16% of them require hospital admission^{6,7}.

Clinical guidelines (SEPAR, NICE, ATS/ERS), consensus documents (GOLD) and clinical guides (SEMES) have been published, whose use is intended to contribute to a better approach to the disease and more rational use of resources, although there are some differences between them, in terms of severity criteria, destination of patients with exacerbation and forms of ventilator support. Compliance with the guidelines is highly recommended by panels of experts and scientific societies, and include a recommendation in the "COPD Strategy of the National Health System"¹⁴. The objective of the present study was to evaluate compliance with the recommendations of the clinical guidelines (SEPAR, GOLD, ATS/ERS, NICE, CTS) in decompensated COPD patients attending the emergency department of Hospital Marqués de Valdecilla (HUMV).

Method

We conducted a retrospective observational study of COPD patients treated in the emergency department of HUMV. The cases, all seen in the period 01/02/2007 to 01/31/2008, had a diagnosis compatible with decompensation of their disease. The COPD criterion was based on medical history. The criterion for decompensation was based on worsening of baseline condition. Data were obtained from ED clinical reports.

The parameters used to assess compliance were taken from the following: GOLD, ATS/ERS Task Force, SEPAR norms, NICE guideline in COPD and CTS recommendations for management of COPD^{1,2,8,9}. The specific parameters used to assess compliance were:

- Assessment of baseline condition^{1,2,8}, using the MRC dyspnea scale.
- Assessment of hemodynamic severity^{2,8}, defined as diastolic blood pressure (DBP) < 70 mmHg and heart rate (HR) > 100 bpm.
- Assessment of respiratory severity: degree of current dyspnea, dyspnea at rest, breathing work measured by use of accessory muscles^{1,2,8} and/or abdominal breathing, respiratory rate > 25 bpm¹ or oxygen saturation < 90%^{1,8}.
- Assessment of infection: using Anthonisen criteria (increased dyspnea, increased sputum volume, and sputum purulence)^{1,2}.

Treatment recommendations were considered adequate according to the guidelines:

- Use of oxygen when oxygen saturation < 90%¹.
- Use of bronchodilators, with the administration of β_2 agonists and short acting ipratropium bromide^{1,2,8} considered as appropriate.
- Use of systemic corticosteroids in cases of severe baseline condition, severe decompensation (serious hemodynamic or respiratory criteria) and mild cases with unfavorable evolution.
- Indication for antibiotic treatment, based on all three Anthonisen criteria or only two when one of them was the appearance of purulent sputum^{1,2}.
- Indication for diuretic use in patients with lower extremity edema^{1,2}.

We also took into consideration any second assessment. For the analysis of the degree of compliance, we calculated the percentage of patients in whom treatment complied with the recommendations, with a 95% confidence interval (CI).

The information was stored on an ACCESS type database and statistical analysis was performed using SPSS v11.

Table 1. Assessment of data collection on hemodynamic and respiratory severity criteria

Hemodynamic and respiratory severity criteria	Cases recorded N (%)
Blood pressure	324 (92)
Heart rate	263 (74.7)
Breathing rate	253 (71.9)
Oxygen saturation	311 (88.4)
Dyspnea at rest	87 (25.3)
Use of accessory muscles	47 (13.4)
Abdominal breathing	11 (3.5)

Results

We included 352 patients who met the criteria for decompensated COPD, mean age 74.8 years (SD \pm 11.2) and 299 (84.9%) were men. Table 1 reflects the severity of hemodynamic and respiratory variables and the number and percentage of patients recorded. Table 2 shows Anthonisen criteria and the number and percentage of patients meeting the criteria.

Of 71 patients with oxygen saturation < 90%, oxygen was administered to 44 (61.9%). Of 240 patients with oxygen saturation > 90%, 114 (47.5%) received it. Bronchodilators were used in 273 (77.6%) cases, 48 (17.5%) of whom received short acting β_2 agonists and ipratropium bromide; 209 (76.5%) received both, together with inhalation aerosol corticosteroids. Systemic corticosteroids were used in 117 (54%) of the 215 patients meeting severity criteria. In patients that did not meet severity criteria, 50 (47.6%) also received systemic corticosteroids.

Antibiotics were administered to 258 patients (73.3%). Indication for administration was only assessed in 133 cases (37.8%); the rest did not fully meet Anthonisen criteria or were not recorded. Of the 133 cases with indication for antibiotic treatment, 56 (42.1%) received it. In addition, 202 patients (78.2%) received antibiotic treatment without indication.

Regarding the use of diuretics, edema was recorded in 40 patients (19.8%) and 15 (37.5%) received diuretic treatment.

A second assessment was made in 58 (16.5%) cases.

Table 2. Assessment of data collection on Anthonisen criteria

Anthonisen criteria	Cases recorded N (%)
Increased dyspnea	292 (83)
Increased sputum volume	274 (78)
Purulent sputum	155 (44)
Use of antibiotics	133 (37.8)

Discussion

The current series has limitations arising from the selection criteria: the study was performed in a single center, and patients were included on the basis of clinical judgment, in the context of a significant degree of under-diagnosis or diagnosis not based on evidence, as reflected in the IBER-POC study³. In addition, the nature of ED work makes data recording difficult and there may be underestimation regarding compliance classification.

The selected indicators are basic to ED assistance, in agreement with the guidelines, given their relevance when assessing the baseline and current state of COPD patients, as well as being the most relevant criteria to define decompensation and its severity. A general analysis revealed scarce collection of data that are fundamental to decision making, such as baseline functional status, only recorded in 27% of cases. The severity of hemodynamic and respiratory criteria, estimated by the existence of dyspnea at rest and use of accessory muscles, was recorded in only 25.3% and 13.4% of patients, respectively, which is insufficient in patients whose primary health disorder involves possible respiratory failure. The same situation has been detected in other studies performed in the ED, with no assessment of dyspnea in 20% of cases; the authors noted the need for better training in this regard¹⁰.

A significant percentage of patients (38.1%) did not receive oxygen therapy despite it being indicated. Moreover, 47.5% received oxygen therapy when no indication existed. These data confirm those of other publications, where patients with oxygen saturation < 90% failed to receive oxygen in 30%, 45.5% and even 61.8% of cases¹¹.

Inhaled bronchodilators were administered in 77.6% of cases, which is suboptimal since they form part of mainstay treatment for these patients. This finding is similar to that of some previous studies, with 74% of patients receiving short-duration inhaled β_2 ¹², but great variability exists^{10,13}.

As for treatment with systemic corticosteroids, 50.4% received them; this proportion is low, but could be justifiable since it is common practice in the ED to administer inhaled corticosteroids, recorded in 76.5% of patients. These data are similar to those of other publications¹².

When assessing the use of antibiotics, Anthonisen criteria are considered essential^{1,2}. We were only able to assess adequacy in 37.8% of

cases, and found that antibiotics were administered without use of the criteria in 78.2%. The same data have been reported in the primary care setting, with more frequent use of antibiotics than recommended by the guidelines¹³.

Suboptimal treatment negatively affects the management of these patients and increases costs¹⁵, but also highlights the need for tools for improvement. There is however no consensus on the best strategy¹⁶. A proposed solution, inter alia, is to provide training through workshops. Another is to increase monitoring and support in an effort to meet the objectives¹⁷. To date, such efforts have been associated with high levels of satisfaction and significant changes in clinical practice, which probably reflects greater familiarity with the guidelines¹⁸, although there is little unanimity on their effectiveness¹⁹.

References

- 1 Guía de práctica clínica de diagnóstico y tratamiento de la Enfermedad Pulmonar Obstructiva Crónica. SEPAR-ALAT, 2009. (Consultado 15 Febrero 2011). Disponible en: www.separ.es
- 2 GOLD executive committee. Global Initiative for Chronic Obstructive Pulmonary Disease. (Consultado 15 Febrero 2011). Disponible en: www.goldcopd.com
- 3 Sobradillo-Peña V, Miravittles M, Jiménez CA, Gabriel R, Viejo JL, Masa JF, et al. Estudio Epidemiológico de la enfermedad pulmonar obstructiva crónica en España (IBERPOC): Prevalencia de síntomas respiratorios crónicos y limitación del flujo aéreo. Arch Bronconeumol. 1999;35:159-66.
- 4 Ancochea J, Badiola C, Duran-Tauleria E, Garcia Rio F, Miravittles M, Muñoz L, et al. [The EPI-SCAN survey to assess the prevalence of chronic obstructive pulmonary disease in Spanish 40-to-80-year-olds: protocol summary]. Arch Bronconeumol. 2009;45:41-7.
- 5 Seemungal TAR, Donaldson GC, Bhowmik A, Jeffries DJ, Wedzicha JA. Time course and recovery of exacerbations in patients with chronic obstructive pulmonary disease. Am J Respir Crit Care Med. 2000;161:160.
- 6 Dalal AA, Shah M, D'Souza AO, Rane P. Costs of COPD exacerbations in the emergency department and inpatient setting. Respir Med. 2011;105:454-60.
- 7 Dalal AA, Shah M, D'Souza AO, Rane P. Costs of inpatient and emergency department care for chronic obstructive pulmonary disease in an elderly Medicare population. J Med Econ. 2010;13:591-8.
- 8 Celli BR, Macnee W. Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. Eur Respir J. 2004;23:932-946.
- 9 O'Donnell DE, Aaron S, Bourbeau J, Hernández P, Marciniuk DP, Balter M, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease-2007 update. Can Respir J. 2007;14:5B-32B.
- 10 Diez O, Smail N, Pontier S, De Biasi J, Montagut M, Didier A. Exacerbations of COPD: An audit of emergency department practice in France. Rev Mal Respir. 2006;23:49-57.
- 11 Considine J, Botti M, Thomas S. Descriptive analysis of emergency department oxygen use in acute exacerbation of COPD. Intern Med J. 2012;42:38-47.
- 12 Considine J, Botti M, Thomas S. Emergency Department Management Of Exacerbation of COPD: Audit Of Compliance With Evidence-Based Guidelines. Intern Med J. 2011;41:48-54.
- 13 Roede BM, Bindels PJE, Brouwer HJ, Bresser P, De Borgie CAJM, Prins JM. Antibiotics and steroids for exacerbations of COPD in primary care: compliance with Dutch guidelines. Br J Gen Pract. 2006;56:662-5.
- 14 Estrategia en EPOC del Sistema Nacional de Salud. Madrid: Ministerio de Sanidad y Política Social; 2009.
- 15 Ramsey SD. Suboptimal medical therapy in COPD: exploring the causes and consequences. Chest. 2000;117:33S-7S.
- 16 Peytremann-Bridevaux I, Staeger P, Bridevaux PO, Ghali WA, Bur-

- nand B. Annual Conference Supplement 2008: Effectiveness of COPD disease management programmes: a systematic review and meta-analysis. *Int J Integr Care*. 2008 Apr-Jun; 8: e34.
- 17 Ramsey SD. Suboptimal medical therapy in COPD: exploring the causes and consequences. *Chest*. 2000;117(Supl 2):33S-7S.
- 18 Moosa D, Blouin M, Hill K, Goldstein R. Workshops to disseminate the Canadian Thoracic Society guidelines for chronic obstructive pulmonary disease to health care professionals in Ontario: Impact on knowledge, perceived health care practices and participant satisfaction. *Can Respir J*. 2009;16:81-5.
- 19 Peytremann-Bridevaux I, Staeger P, Bridevaux PO, Ghali WA, Bur-nand B. Annual Conference Supplement 2008: Effectiveness of COPD disease management programmes: a systematic review and meta-analysis. *Int J Integr Care*. 2008;8:e34.

Valoración del seguimiento de las guías clínicas en la exacerbación de la enfermedad pulmonar obstructiva crónica (EPOC) en el servicio de urgencias

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Se describe la experiencia clínica en cuanto al grado de cumplimiento de las guías clínicas en pacientes con enfermedad pulmonar obstructiva crónica (EPOC) atendidos en un servicio de urgencias hospitalario (SUH). Se han revisado las historias de 352 pacientes atendidos por EPOC durante un periodo de 1 año. Se ha observado que la presión arterial se registró en el 92% de los casos, la frecuencia cardiaca en el 74,7%, la frecuencia respiratoria en el 71,9%, la saturación arterial de oxígeno en el 88,4%, la presencia de disnea en reposo en el 25,3% y el uso de musculatura accesoria en el 13,4%. De los casos en los que pudo valorarse la antibioticoterapia, ésta se administró sin indicación en el 78,2%, y sólo 117 de los 215 pacientes con criterios de gravedad recibieron corticoides sistémicos (54%). En conclusión, se constata un cumplimiento bajo en la valoración de ítems necesarios para la aplicación de guías clínicas en la EPOC por lo que es necesario buscar herramientas para la mejora en el seguimiento de las recomendaciones de las vías clínicas. [*Emergencias* 2012;24:296-299]

Palabras clave: Enfermedad pulmonar obstructiva crónica (EPOC). Descompensación. Guías clínicas. Servicios de urgencias.