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ORIGINAL ARTICLE

High doses of systemic corticosteroids in patients hospitalized for exacerbation of chronic obstructive pulmonary disease. A cohort study☆

J.A. Rueda-Camino*, D. Bernal-Bello, J. Canora-Lebrato, L. Velázquez-Ríos, V. García de Viedma-García, M. Guerrero-Santillán, M.A. Duarte-Millán, R. Cristóbal-Bilbao, A. Zapatero-Gaviria

Servicio de Medicina Interna, Hospital Universitario de Fuenlabrada, Fuenlabrada, Madrid, Spain

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KEYWORDS
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Abstract
Objectives: To assess the effect of high doses of corticosteroids in patients hospitalized for exacerbation of chronic obstructive pulmonary disease (COPD).
Patients and methods: A prospective cohort study was conducted on patients hospitalized with COPD between January and March 2015, grouped according to the glucocorticoid dosage administered (cutoff, 40 mg of prednisone/day). We compared the results of hospital stay, readmission and mortality at 3 months of discharge.
Results: We analyzed 87 patients. The median daily dose was 60 mg of prednisone (interquartile range, 46.67–82.33 mg/day), and the administration route was intravenous in 96.6% of the cases. We established a relative risk (RR) for hospital stays longer than 8 days of 1.095 (95% CI 0.597–2.007; $p = .765$) when steroid dosages greater than 40 mg/day were employed. In these patients, the hazard ratio (HR) for readmission in the 3 months after discharge was 0.903 (95% CI 0.392–2.082; $p = .811$), and the mortality was 1.832 (95% CI 0.229–16.645; $p = .568$). Neither the RR nor the HR varied in a statistically significant manner after adjusting for confounding factors.
Conclusions: A daily dose greater than 40 mg of prednisone in patients hospitalized for COPD exacerbation was not associated with a shorter hospital stay or a reduction in readmissions or mortality at 3 months.

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* Corresponding author.
E-mail address: joseantonio.rueda@salud.madrid.org (J.A. Rueda-Camino).

PALABRAS CLAVE
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Glucocorticoides;
Mortalidad

Dosis altas de corticoides sistémicos en pacientes ingresados por exacerbación de enfermedad pulmonar obstructiva crónica. Un estudio de cohortes

Resumen
Objetivos: Evaluar el efecto de las dosis altas de corticoides en pacientes ingresados por exacerbación de una enfermedad pulmonar obstructiva crónica (EPOC).
Pacientes y métodos: Estudio de cohortes prospectivo de enfermos hospitalizados con EPOC entre enero y marzo de 2015, agrupados en función de la dosis de glucocorticoides recibida (punto de corte: 40 mg de prednisona/día). Se compararon los resultados de estancia hospitalaria, y de reingreso y mortalidad a los 3 meses del alta.
Resultados: Se analizaron 87 pacientes. La mediana de la dosis diaria recibida fue de 60 mg de prednisona/día (rango intercuartílico: 46,67-82,33 mg/día); la vía de administración fue endovenosa en el 96,6% de los casos. Se estableció un riesgo relativo (RR) de estancia superior a 8 días de 1,095 [intervalo de confianza (IC) 95%: 0,597-2,007; p = 0,765] cuando se usaban dosis de esteroides superiores a 40 mg/día. Además, en estos pacientes la *hazard ratio* (HR) para el reingreso durante los 3 meses siguientes al alta fue de 0,903 [IC 95%: 0,392-2,082; p = 0,811] y la mortalidad de 1,832 [IC 95%: 0,229-16,645; p = 0,568]. Ni el RR ni las HR observadas variaron de forma estadísticamente significativa tras el ajuste por factores de confusión.
Conclusiones: Una dosis superior a 40 mg diarios de prednisona en pacientes ingresados por exacerbación de EPOC no se asocia a una menor estancia hospitalaria ni a una disminución del reingreso y de la mortalidad a los 3 meses.

Background

Chronic obstructive pulmonary disease (COPD) is one of the main causes of morbidity and mortality in developed countries.[1] Clinical practice guidelines establish the need to treat patients hospitalized for COPD exacerbation with systemic corticosteroids. The recommended daily regimen is 40 mg of prednisone orally for 5 days.[2–4] However, the clinical audit of patients hospitalized for COPD exacerbation in Spain (AUDIPOC) study showed considerable variability in the actual treatment of these patients.[5] An observational study with a large sample size observed no differences between a strategy based on low-dose corticosteroids administered orally and one that used high doses intravenously.[6]

The objective of the present study was to assess, in patients hospitalized for COPD exacerbation, the effect of high-dose corticosteroids on hospital stay, readmission and mortality at 3 months of discharge.

Patients and methods

A prospective cohort study was conducted of patients who were consecutively admitted to the departments of internal medicine, pulmonology and intensive care for COPD exacerbation between January and March 2015 in the University Hospital of Fuenlabrada (Madrid, Spain), a center with a reference population in January 2015 of 220,000 inhabitants. The decision for hospitalization depended on the clinical judgment of the team that treated the patients on each occasion. The decision to prescribe systemic corticosteroids, as well as the dosage and treatment duration, depended on the clinical judgment of the physician responsible for the patient. We excluded those patients who were not treated with systemic corticosteroids.

The patients' demographic and clinical data were reviewed retrospectively using the hospital's medical record information manager. The endpoints were the length of hospital stay and the readmissions and mortality during the 3 months following discharge.

To avoid influencing the therapeutic approach during hospitalization, the study monitoring remained blind for the physicians responsible for the hospitalization. Standard clinical practice was not modified by the inclusion of the patient into the study.

We grouped the patients into 2 categories depending on the dose of corticosteroids administered: <40 mg or >40 mg of prednisone or equivalent. To this end, we designed the variable daily dose (DD) dividing the total dose administered between the days of corticosteroid treatment. We also established 2 groups according to whether the hospital stay was longer or shorter than the median stay.

The statistical analysis was performed using the IBM SPSS Statistics 22 software. The quantitative variables are listed using their frequency distribution and were compared using the chi-squared test and Fisher's exact test, as appropriate. The quantitative variables with symmetrical distribution are listed as mean and standard deviation (SD) and were compared with Student's *t*-test. The asymmetric variables are listed using their median and interquartile range (IQR), establishing the comparisons with the median test.

The univariate data analysis was performed using the calculation of the relative risk (RR) for the median hospital