

# BMJ Open Quality **Duration of corticosteroid use in chronic obstructive pulmonary disease exacerbations: improving prescribing practices on clinical teaching units with peer-to-peer teaching**

Catherine Matte,<sup>1</sup> Johnston Hoang,<sup>1</sup> Dev Jayaraman,<sup>1,2</sup> Laurence Green,<sup>1,2</sup> Suzanne N Morin<sup>1,2</sup>

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<sup>1</sup>Faculty of Medicine, McGill University, Montreal, Quebec, Canada

<sup>2</sup>Department of Medicine, McGill University Health Centre, Montreal, Quebec, Canada

## Correspondence to

Dr Dev Jayaraman;  
dev.jayaraman@mcgill.ca

## ABSTRACT

**Introduction** The most recent Global Initiative for Chronic Obstructive Lung Disease consensus recommends a 5-day course of corticosteroid (CS) therapy for acute chronic obstructive pulmonary disease exacerbations (ACOPDE). As inappropriate use of CS therapy is associated with adverse events, we implemented a peer-to-peer education intervention to improve adherence to guidelines for patients with ACOPDE admitted to a medical clinical teaching unit at a tertiary care university centre.

**Methods** Our study was a before–after design study with a concurrent control of a 15 min peer-to-peer educational intervention targeting medical residents at the beginning of a 4-week rotation for 12 consecutive months. Another medical teaching unit within the same university network, but at a different site, served as a concurrent control. The primary outcome was the proportion of patients who received appropriate duration of CS therapy (5 days) for ACOPDE during the intervention period as compared with the 12-month preintervention period at the intervention and control hospitals.

**Results** Following the intervention, there was an increase in the proportion of patients receiving appropriate duration of CS therapy (34.2% to 51.3%,  $p=0.02$ ) at the intervention hospital and no significant difference at the control hospital (22.8% to 34.1%,  $p=0.15$ ). This effect was maintained at the intervention hospital 3 months postintervention period.

**Conclusion** A short peer-to-peer educational intervention targeting medical residents on a clinical teaching unit improved adherence to appropriate duration of CS therapy for ACOPDE.

## INTRODUCTION

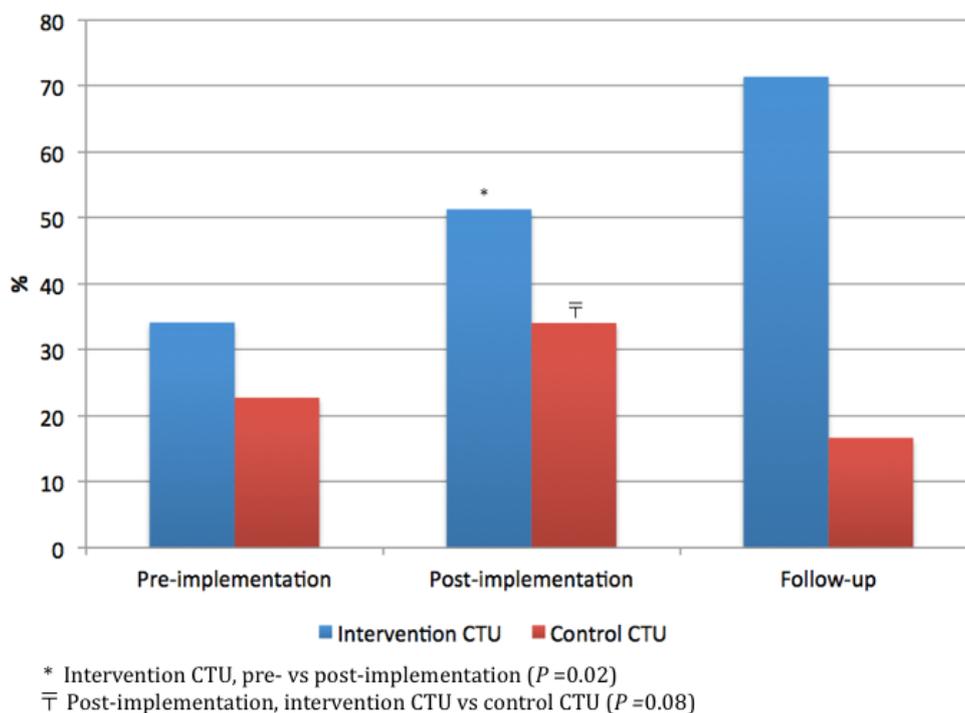
Chronic obstructive pulmonary disease exacerbations (COPDE) contribute to long-term decline in lung function and cause serious morbidity and mortality.<sup>1</sup> Systemic corticosteroids (CS) are the mainstay of therapy and are associated with shorter recovery, improved lung function and reduced hospital stay.<sup>2</sup> The most recent Global Initiative for Chronic Obstructive Lung Disease

consensus recommends a total duration of 5 days of CS for the treatment of COPDE.<sup>3,4</sup> Since inappropriate duration of CS use is associated with adverse events,<sup>2</sup> we aimed to optimise the duration of CS therapy (5 days) in adults hospitalised for COPDE on medical clinical teaching units (CTUs) of an academic medical centre with peer-to-peer teaching.

## METHODS

We used a before–after with concurrent control study design to determine the effect of a standardised 15 min educational presentation targeting internal medicine trainees on the optimal duration of CS therapy in patients admitted with COPDE. The presentation, by senior medical residents, occurred at the beginning of every 4-week internal medicine CTU rotation at one of two teaching hospitals of the McGill University Health Centre (Montreal, Canada) for 12 consecutive months (March 2014–February 2015). The other hospital's CTU served as the control. The 15 min PowerPoint presentation consisted of a review of the current guidelines for CS use for patients admitted with COPDE, with an emphasis on limiting the duration of CS use to 5 days. Data from preimplementation period were also presented, and the proportion of patients who conformed to the guidelines was highlighted.

Retrospective medical record review was conducted preimplementation (P1) (June 2013–February 2014) and postimplementation (P2) (March 2014–February 2015) for all patients,  $\geq 18$  years, admitted with a COPDE to the CTUs at the intervention and control hospitals (i-CTU and c-CTU, respectively). Pregnant patients were excluded. Exit prescriptions for patients discharged



**Figure 1** Proportion of chronic obstructive pulmonary disease exacerbation admissions during which patients received 5 days of corticosteroids. CTU, clinical teaching unit.

before 5 days were reviewed for the total duration of CS therapy. To determine the sustainability of the intervention, we also examined the records of patients admitted to both CTUs 3 months following the end of the intervention (P3) (February 2015–April 2015). The educational presentation was not given during P3.

The primary endpoint was the change in the proportion of COPDE admissions during which patients received the recommended 5-day course of CS at the end of P2 compared with P1. Variables were compared using  $\chi^2$  or Wilcoxon-Mann-Whitney test as appropriate.

## RESULTS

During P1, there were 85 COPDE admissions (70 patients) on i-CTU and 55 on c-CTU (51 patients), and 87 (77 patients) admissions on i-CTU and 39 (35 patients) on c-CTU during P2. Patients' characteristics were comparable between the two sites (i-CTU vs c-CTU: mean age 74.3 (SD: 10.2) vs 74.0 (SD: 12.3) years,  $p=0.99$ ; 48.3% vs 48.8% female,  $p=0.99$ ; 37.4% vs 40.7% active smokers,  $p=0.67$ ; and 14.2% vs 12.8% on home oxygen,  $p=0.99$ ).

The median duration of CS use was 6 days for both i-CTU (range 0–38) and c-CTU (range 0–28) during P1 ( $p=0.47$ ), and 5 days for both i-CTU (range 0–26) and for c-CTU (range 0–15) during P2 ( $p=0.89$ ). During P1, 34.2% of COPDE on i-CTU and 22.8% on c-CTU were treated according to the recommendations. Following the intervention, there was an increase in the proportion of appropriately treated COPDE on i-CTU (51.3%,  $p=0.02$ ),

compared with no change on c-CTU (34.1%,  $p=0.15$ ), with a trend towards optimal prescribing behaviour on i-CTU versus c-CTU ( $p=0.08$ ) (figure 1). This effect was maintained during the 3-month follow-up period (i-CTU: 71.4%; c-CTU: 16.7%). Thirty-day readmission rates were similar and did not change following the intervention (i-CTU: 13.8% and c-CTU: 17.5% at the end of P2).

## DISCUSSION

Implementation of a short educational presentation led to sustained improvement in a durable adherence to guidelines with regard to the duration of CS therapy in COPDE.

Our results contrast with those published by Hope *et al.*<sup>5</sup> who documented no improvement in prescribing behaviour following a pharmacist-led educational intervention on CS guideline adherence. Although ensuring adherence to guidelines can be challenging, the success of our intervention may be due to the reliance on peer-to-peer teaching, which is at the heart of the CTU model. As the junior residents rotate through the CTU again as junior or senior residents, the practice becomes embedded within the CTU culture and may represent a strategy to translate clinical guidelines into sustainable practice.<sup>6</sup> However, our intervention focused only on one aspect of improving prescribing practices, as we wanted to study the effect of peer-to-peer teaching. We did not include individual feedback to prescribers or CTU pharmacists involvement in continued guidance or instruction. Our system also does not have a physician order



entry system to allow for automated suggestions. These factors may be responsible for nearly 50% of patients in the i-CTU not receiving guideline-adherent CS therapy for COPDE.

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