Impact of a Pathway for Chronic Obstructive Pulmonary Disease Exacerbations (COPDE) on Antimicrobial Prescribing and Readmissions

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Background

Chronic obstructive pulmonary disease exacerbations (COPDE) are frequently overtreated with antibiotics. In April 2014, a clinical pathway for COPDE was released as part of our Antimicrobial Stewardship Program (ASP) at The Ottawa Hospital (TOH). TOH is an 1100-bed, tertiary-care institution in Ottawa, Canada, with acute care beds distributed over two geographically distinct campuses.

Objectives

To determine if: 1) The clinical pathway (intervention) resulted in improved antibiotic prescribing; 2) Patients treated as per the pathway had different 30-day readmission rates for COPDE/pulmonary infections compared to those who were not.

Methodology

• Retrospective chart review of patients admitted with a COPDE between Sept. and Dec. 2013 (pre-intervention), and between Sept. and Dec. 2014 (post-intervention) under internal medicine, family medicine, and respirology services, and the intensive care unit. Only the first eligible admission per service was included.

• Exclusion criteria: concomitant pneumonia, concomitant conditions not covered by the pathway (e.g., cystic fibrosis).

• Outcomes: appropriateness of the decision to prescribe an antibiotic, choice of antibiotic and duration of treatment as defined in the COPDE pathway; readmission rates due to a pulmonary infection or COPDE within 30 days of discharge for patients treated and not treated according to the pathway.

Results and Discussion

A total of 85 pre-intervention charts and 76 post-intervention charts were included, but not all outcomes could be assessed in every chart reviewed. As shown in Figure 1, an improvement in all three outcomes was observed for both campuses combined and at Campus A. The greatest improvements were noted at Campus A for the appropriateness of the decision to prescribe antibiotics (16% absolute improvement, p<0.05; n pre=45, n post=47) and duration of therapy (12% absolute improvement, p<0.05; n pre=30, n post=33); whereas the appropriateness to prescribe antibiotics decreased at Campus B (16% p>0.05; n pre=40, n post=29). The reason for this discrepancy is unclear, but may be partially attributed to a decreased presence of the ASP at that campus from mid-October to December 2014 due to a lack of resources. The case mix for the 2 campuses for the services assessed is not different.

Figure 1: Pre- and post-intervention appropriateness of antibiotic prescribing

Among cases where the choice of antibiotic was considered inappropriate (n=34), over 90% were due to the prescribing of both a beta-lactam and a macrolide or a tetracycline, whereas our pathway recommends single agents only.

Overall, regardless of the time period, 12/92 (13%) of patients treated according to the pathway with regards to the 3 outcomes measured were readmitted within one month of discharge for a COPDE or a pulmonary infection, compared to 7/44 (16%) who were not treated according to the pathway (p>0.05).

Study limitations include the small sample size and retrospective nature of this analysis. In addition, the impact of this pathway on resistance and adverse events (e.g., C. difficile), and the severity of illness of patients (which may have impacted management and readmission rates) were not assessed.

Conclusion

Our COPDE pathway, in conjunction with active promotion by the ASP helped improve antibiotic management of COPDE. More efforts will be deployed towards promoting the selection of single antibiotic agents. Treating according to the pathway did not result in an increase in readmission rates.