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Original Investigation



January 28, 2019

More

Association of Antibiotic Treatment With Outcomes in Patients Hospitalized for an Asthma Exacerbation Treated With Systemic Corticosteroids

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Full Text

Key Points

Question Among patients hospitalized for an asthma exacerbation and treated with corticosteroids, does the addition of antibiotic therapy result in better outcomes?

Findings In this cohort study of 19 811 patients hospitalized for an asthma exacerbation treated with corticosteroids, 8788 (44%) received antibiotics during the first 2 days of hospitalization. Compared with patients who were not treated with antibiotics, treated patients had a significantly longer hospital stay, similar rate of treatment failure, and higher risk of antibiotic-related diarrhea.

Meaning Antibiotic treatment may not be associated with better outcomes and should not be prescribed routinely in adult patients hospitalized for asthma treated with corticosteroids.

Abstract

Importance Although professional society guidelines discourage use of empirical antibiotics in the treatment of asthma exacerbation, high antibiotic prescribing rates have been recorded in the United States and elsewhere.

Objective To determine the association of antibiotic treatment with outcomes among patients hospitalized for asthma and treated with corticosteroids.

Design, Setting, and Participants Retrospective cohort study of data of 19 811 adults hospitalized for asthma exacerbation and treated with systemic corticosteroids in 542 US acute care hospitals from January 1, 2015, through December 31, 2016.

Exposures Early antibiotic treatment, defined as an treatment with an antibiotic initiated during the first 2 days of hospitalization and prescribed for a minimum of 2 days.

Main Outcomes and Measures The primary outcome measure was hospital length of stay. Other measures were treatment failure (initiation of mechanical ventilation, transfer to the intensive care unit after hospital day 2, in-hospital mortality, or readmission for asthma) within 30 days of discharge, hospital costs, and antibiotic-related diarrhea. Multivariable adjustment, propensity score matching, propensity weighting, and instrumental variable analysis were used to assess the association of antibiotic treatment with outcomes.

Results Of the 19 811 patients, the median (interquartile range [IQR]) age was 46 (34-59) years, 14 389 (72.6%) were women, 8771 (44.3%) were white, and Medicare was the primary form of health insurance for 5120 (25.8%). Antibiotics were prescribed for 8788 patients (44.4%). Compared with patients not treated with antibiotics, treated patients were older (median [IQR] age, 48 [36-61] vs 45 [32-57] years), more likely to be white (48.6% vs 40.9%) and smokers (6.6% vs 5.3%), and had a higher number of comorbidities (eg,

congestive heart failure, 6.2% vs 5.8%). Those treated with antibiotics had a significantly longer hospital stay (median [IQR], 4 [3-5] vs 3 [2-4] days) and a similar rate of treatment failure (5.4% vs 5.8%). In propensity score–matched analysis, receipt of antibiotics was associated with a 29% longer hospital stay (length of stay ratio, 1.29; 95% CI, 1.27-1.31) and higher cost of hospitalization (median [IQR] cost, \$4776 [\$3219-\$7373] vs \$3641 [\$2346-\$5942]) but with no difference in the risk of treatment failure (propensity score–matched OR, 0.95; 95% CI, 0.82-1.11). Multivariable adjustment, propensity score weighting, and instrumental variable analysis as well as several sensitivity analyses yielded similar results.

Conclusions and Relevance Antibiotic therapy may be associated with a longer hospital length of stay, higher hospital cost, and similar risk of treatment failure. These results highlight the need to reduce inappropriate antibiotic prescribing among patients hospitalized for asthma.

Full Text

Comment

1 Comment for this article January 28, 2019

Conclusions of non-randomised association studies fraught

Gregory Larkin, MD MSBiost | NE Ohio College of Medicine

This is a provocative study and certainly begs more questions than answered.

One can "control for other factors statistically" to an extent. The absence of interaction terms, for example, on age x abx exposure, may temper these results further.

At bottom, without a proper randomised prospective design, studies like these cannot answer the questions that really matter...

Antibiotics may indeed be bootless, but association studies don't generally give us that answer..

CONFLICT OF INTEREST: None Reported

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