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Session: C37 Optimizing Asthma Care Across Diverse Patients

Abstract Presentation Time: Tuesday, May 22, 11:15 a.m. PST

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Unnecessary Antibiotic Use in Asthma Exacerbations May Increase Hospital Stay, Costs

ATS 2018, San Diego, CA – Administering antibiotics to adults hospitalized with an asthma exacerbation without any documented indication of lung infection appears to lengthen hospital stay, increase cost and result in increased risk for antibiotic-related diarrhea, according to new research presented at the ATS 2018 International Conference.

“Clinical guidelines, including the Global Initiative for Asthma, state that there is no role for antibiotics in asthma exacerbations unless there is strong evidence of lung infection,” said lead study author Mihaela S. Stefan, MD, PhD, a research scientist at the Institute for Healthcare Delivery and Population Science and associate professor at the University of Massachusetts Medical School in Springfield.

Dr. Stefan noted that a prior study conducted by her research group found that 60 percent of patients received antibiotics without an indication of lung infection. “Nevertheless, few studies have assessed whether antibiotics could be beneficial in these patients,” she added.

In the largest observational comparative effectiveness study to date, the researchers analyzed the medical records of patients hospitalized for asthma over a two-year period at 554 U.S.

hospitals. They excluded patients with any potential reason for receiving antibiotics, including being diagnosed with a sinus infection, pneumonia, bronchitis, emphysema, sepsis or any other condition that should be treated with antibiotics.

Of the remaining 22,043 patients, 46.1 percent were treated with antibiotics within their first two hospital days. The researchers conducted several types of analyses. Using propensity-matched analysis, which they characterized as the most “robust,” they found that those receiving antibiotics had:

- longer hospital stays, 4.64 vs 3.4 days;
- higher hospitalization costs, \$6,427 vs. \$5,387; and
- a 55 percent higher risk of antibiotic-related diarrhea.

There was no difference in treatment failure between those who received antibiotics and those who did not. Treatment failure was defined as the initiation of invasive or noninvasive mechanical ventilation, transfer to the intensive care unit after hospital day two, and in-hospital mortality or readmission for asthma exacerbation within 30 days of discharge.

“Our results strengthen the evidence that antibiotics should not be prescribed routinely in adult patients hospitalized with asthma,” Dr. Stefan said, adding that all patients in the study had received systemic steroids and bronchodilators, the standard of care for patients experiencing an asthma exacerbation. “All hospitals should assess their practice in caring for patients hospitalized with asthma and increase their antibiotic stewardship.”

She added that her research group is planning a qualitative study to understand why physicians use antibiotics in asthma.

Contact for Media

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This abstract has been revised since the original abstract was submitted.

Abstract 16204

High Antibiotics Prescribing in Patients Hospitalized with Asthma Exacerbation - but Are Antibiotics Associated with Better Outcomes?

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Importance: More than half of patients hospitalized for asthma receive antibiotics in the absence of a clear indication.

Objective: To compare the outcomes of patients hospitalized with asthma exacerbation and treated with antibiotic therapy with those not treated with antibiotics.

Design: Retrospective cohort study from January 1, 2015 through December 31, 2016

Setting: 554 acute care US hospitals

Participants: Patients 18 years or older, hospitalized with asthma exacerbation, and treated with systemic corticosteroids.

Exposure: Antibiotic treatment defined as an antibiotic initiated during the first two days of hospitalization and prescribed for a minimum of 2 days.

Main outcome and measures: length of stay. Other measures: 1) treatment failure: defined as the initiation of mechanical ventilation, or transfer to ICU after hospital day 2, or in-hospital mortality, or readmission for asthma within 30 days of discharge; 2) hospital costs; and 3) antibiotic-related diarrhea.

Results: Of the 22,043 patients 46.1% received antibiotics. Treated patients were older (mean age: 50.5 vs 46.6 years), more likely to be white (49.6% vs 41.5%) and smokers (7.6% vs. 5.5%), and had a higher number of comorbidities than those not treated. Compared with patients not treated with antibiotics, those treated with antibiotics had longer hospital stays (mean: 4.4 vs 3.4 days, $p < 0.0001$), but similar treatment failure rate (5.56% vs. 5.64%). In propensity matched analysis, receipt of antibiotics remained associated with longer stay in the hospital (RR: 1.27; 95% CI, 1.25-1.29), higher cost of hospitalization (mean cost \$6427 vs \$5387), and increased risk of antibiotic-related diarrhea (OR: 1.55; 95% CI, 1.16-2.08), but not with an increased risk of treatment failure (OR: 1.02; 95% CI, 0.88-1.17). Multivariable adjustment and hierarchical modeling to account for possible confounders and the hospital effect, as well as several sensitivity analyses yielded similar results.

Conclusions and relevance: In conclusion, antibiotic therapy was not associated with reduce treatment failure however was associated with increased length of stay, hospital cost and antibiotic-related diarrhea. Our results strengthen the evidence that antibiotics should not be prescribed routinely in adults patients hospitalized with asthma.