2891. Trends in Inpatient Antibiotic Use in US Hospitals, 2012–2017
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Session: 309. Glass Half Full or Half Empty? Trends in Antimicrobial Prescribing
Saturday, October 5, 2019: 3:30 PM

Background. The National Action Plan for Combating Antibiotic-resistant Bacteria calls for monitoring inpatient antibiotic use to inform stewardship efforts. We estimated national trends in inpatient antibiotic usage from 2012 to 2017 in a large cohort of US hospitals.

Methods. We utilized the Premier Healthcare Database, containing detailed administrative records available by census region, including inpatient drug utilization data based on billing records, for all patients discharged from a convenience sample of over 700 US hospitals annually, approximately 20% of US inpatient discharges. We retrospectively estimated days of therapy (DOT)/1,000 patient-days (PDs) by year overall and by antibiotic class. To examine trends over time, we created multivariable models adjusting for hospital-specific location of antibiotic use (ICU vs. other) and hospital-specific summary measures including average patient age, average co-morbidity score, case mix index, number of hospital beds, teaching status, urban/rural location, US census division, proportion of discharges with a surgical diagnosis-related code, and proportion of PDs with an infectious disease primary ICD-9/10-CM discharge code. Estimates and models were weighted to be nationally representative using projected weights from the database.

Results. 58% of patients had at least one antibiotic DOT, and the overall DOT for all hospitals was 810 DOT/1,000 PDs (interquartile range 701 to 913 DOT/1,000 PDs). Glycopeptides and third-/fourth-generation cephalosporins were the most common antibiotic classes (Figure 1). Overall antibiotic DOT did not change significantly over time, P = 0.9133. However, class-specific DOT varied with large decreases in fluoroquinolones from 2012 to 2017 (55% decrease, P < 0.0001), and large increases in third-/fourth-generation cephalosporins and tetracyclines (32% and 49% increase, respectively, P < 0.0001) (Figure 2). Overall antibiotic DOT significantly varied among US census divisions (Figure 3).

Conclusion. Estimated overall inpatient antibiotic DOT did not change in US hospitals from 2012 to 2017, but there were significant class-specific changes. The large decrease in fluoroquinolone use may reflect increased awareness of adverse events.

Disclosures. All Authors: No reported Disclosures.

2892. The Relationship Between Inpatient and Post-discharge Antimicrobial Use at the Hospital-level Across an Integrated Healthcare Network
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Session: 309. Glass Half Full or Half Empty? Trends in Antimicrobial Prescribing
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Background. The National Healthcare Safety Network (NHSN) has emphasized the importance of hospital-level antimicrobial stewardship efforts. Despite the importance of post-discharge antimicrobial use, little is known about the relationship between inpatient and post-discharge antimicrobial use at the hospital-level.

Methods. We utilized the Premier Healthcare Database, containing detailed administrative records available by census region, including inpatient drug utilization data based on billing records, for all patients discharged from a convenience sample of over 700 US hospitals annually, approximately 20% of US inpatient discharges. We retrospectively estimated days of therapy (DOT) per 1,000 patient-days (PDs) by year overall and by antibiotic class. To examine trends over time, we created multivariable models adjusting for hospital-specific location of antibiotic use (ICU vs. other) and hospital-specific summary measures including average patient age, average co-morbidity score, case mix index, number of hospital beds, teaching status, urban/rural location, US census division, proportion of discharges with a surgical diagnosis-related code, and proportion of PDs with an infectious disease primary ICD-9/10-CM discharge code. Estimates and models were weighted to be nationally representative using projected weights from the database.

Results. 58% of patients had at least one antibiotic DOT, and the overall DOT for all hospitals was 810 DOT/1,000 PDs (interquartile range 701 to 913 DOT/1,000 PDs). Glycopeptides and third-/fourth-generation cephalosporins were the most common antibiotic classes (Figure 1). Overall antibiotic DOT did not change significantly over time, P = 0.9133. However, class-specific DOT varied with large decreases in fluoroquinolones from 2012 to 2017 (55% decrease, P < 0.0001), and large increases in third-/fourth-generation cephalosporins and tetracyclines (32% and 49% increase, respectively, P < 0.0001) (Figure 2). Overall antibiotic DOT significantly varied among US census divisions (Figure 3).

Conclusion. Estimated overall inpatient antibiotic DOT did not change in US hospitals from 2012 to 2017, but there were significant class-specific changes. The large decrease in fluoroquinolone use may reflect increased awareness of adverse events.

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1. From April 2017 to October 2018, abstractors collected data (medical record, phone calls 30-days post-discharge) on adult, non-ICU patients hospitalized with community-acquired pneumonia (CAP) can be safely treated with 5 days of antibiotics, but many are not. We determined whether a hospitalist-collaborative can reduce excess antibiotic duration in patients with CAP through partnership with antibiotic stewardship teams (AST), data feed back, pay-for-performance, and sharing best practices.

2. Most patients hospitalized with community-acquired pneumonia (CAP) can be safely treated with 5 days of antibiotics, but many are not. We determined whether a hospitalist-collaborative can reduce excess antibiotic duration in patients with CAP through partnership with antibiotic stewardship teams (AST), data feedback, pay-for-performance, and sharing best practices.

Results. Among 1.7 million acute-care admissions across 122 VHA hospitals, 46.1% were administered inpatient antimicrobials and 19.9% were prescribed an oral antimicrobial at discharge. Fluoroquinolones were the most common antimicrobial prescribed at discharge among 335,396 antimicrobial prescriptions (38.3%). At the hospital-level, median inpatient antimicrobial use was 331.3 DOTs per 100 admissions (interquartile range (IQR) 284.9–367.9) and median post-discharge use was 209.5 DOTs per 100 admissions (IQR 181.5–239.6). Thirty-nine percent of the total duration of antimicrobial exposure occurred after hospital discharge. The metrics of inpatient DOTs per 100 admissions and post-discharge DOTs per 100 admissions were weakly correlated at the hospital-level (rho = 0.44, P < 0.0001).

Conclusion. Antimicrobial-prescribing at hospital discharge was common and contributed substantially to the total antimicrobial exposure associated with an acute-care hospital stay. A hospitalist’s inpatient antimicrobial use was only weakly correlated with its post-discharge antimicrobial use. Antimicrobial stewardship interventions should specifically target antimicrobial-prescribing at discharge.

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2893. The Michigan Hospital Medicine Safety Consortium: Improving Patient Care by Reducing Excessive Antibiotic Use in Patients Hospitalized with Community-Acquired Pneumonia

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Session: 309. Glass Half Full or Half Empty? Trends in Antimicrobial Prescribing Saturday, October 5, 2019: 4:00 PM

Background. Most patients hospitalized with community-acquired pneumonia (CAP) can be safely treated with 5 days of antibiotics, but many are not. We determined whether a hospitalist-collaborative can reduce excess antibiotic duration in patients with CAP through partnership with antibiotic stewardship teams (AST), data feedback, pay-for-performance, and sharing best practices.

Methods. From April 2017 to October 2018, abstractors collected data (medical record, phone calls 30-days post-discharge) on adult, non-ICU patients hospitalized with CAP through partnership with antibiotic stewardship teams (AST), data feedback, pay-for-performance, and sharing best practices. To determine appropriate antibiotic duration based on patient factors (e.g., clinical stability). All hospitals received quarterly reports on appropriate 5-day treatment who received 5 ± 1 days increased antibiotic duration. Between April 2017 and October 2018, the proportion of patients eligible for a 5-day duration of antibiotic treatment who received 5 ± 1 days increased from 19.8% (181/914) to 30.9% (207/670; P = 0.01), a relative improvement of 56.1% (Figure 1). During this time period, there were no changes in 30-day post-discharge death, readmission, emergency room visit, Clostridioides difficile infection, or provider-documented antibiotic-associated adverse-events (Table 1). However, there was a decrease (3.3% to 1.7%, P = 0.03 for change over time; relative reduction: 48.5%) in patient-reported antibiotic-associated adverse events (Figure 2).

Conclusion. A hospitalist-collaborative partnership with AST can safely reduce excess antibiotic duration and antibiotic-associated adverse events in hospitalized patients with CAP.

Table 1. Adjusted 30-day Post-Discharge Outcomes in Patients Hospitalized with Community-Acquired Pneumonia Who were Eligible for 5-day Antibiotic Treatment Duration, by Quarter, N=443 hospitals, 4,485 patients

| Quarter 1 | Quarter 2 | Quarter 3 | Quarter 4 |
|-----------|-----------|-----------|-----------|
| DOTs | DOTs | DOTs | DOTs |
| 2016-2017 | (n=651) | (n=652) | (n=653) | (n=654) |
| 2017-2018 | (n=655) | (n=656) | (n=657) | (n=658) |
| 2018-2019 | (n=659) | (n=660) | (n=661) | (n=662) |
| 2019-2020 | (n=663) | (n=664) | (n=665) | (n=666) |

Proportions of patients experiencing an adverse-event over time are shown using linear mixed models adjusted for patient characteristics associated with excessive duration (length of stay, Guam production, acquisition findings, leukopenia, positive sputum culture or non-sputum diagnostic test, and congestive heart failure exacerbation), adjusted for patient characteristics known to be associated with each outcome, and inverse probability of treatment weighting. P < 0.05 is significant.

* We offer from overall analysis, patient-reported adverse-events were collected via phone call 30-days after discharge based on the answer to the following question: “Have you had any side effects from your prescribed antibiotics?” Between Q2 2017 and Q2 2018, 475 (35.3%) of CAP patients eligible for 5-day antibiotic treatment were eligible for a phone call and 2586 (60.7%) of eligible patients were contacted by phone.