161. Characteristics of Prospective Audit and Feedback in a Pediatric Cardiovascular Intensive Care Unit
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Session: 169. Stewardship: Pediatric Antimicrobial Stewardship
Friday, October 6, 2017: 12:30 PM

Background. Prospective audit and feedback (PAF) in the pediatric cardiovascular intensive care unit (CVICU) has not been elaborated. A formal program was implemented in our institution’s pediatric CVICU on 12/07/15. The purpose of this study was to describe characteristics of PAF recommendations in a pediatric CVICU after implementation with a comparison of antimicrobial utilization before and after.

Methods. Antimicrobial audits for patients admitted to the Lucile Packard Children’s Hospital Stanford CVICU between December 7, 2015 and November 30, 2016 were reviewed. Audits were performed by the Antimicrobial Stewardship Program (ASP) Pharmacist and reviewed with the ASP Medical Director, before being communicated to the CVICU Pharmacist. The CVICU Pharmacist communicated recommendations to the medical team, and adherence was assessed within 48 hours. The days of therapy (DOT) per 1,000 patient-days from June 1, 2015 to November 30, 2016 were collected to evaluate the impact of PAF on antimicrobial utilization.

Results. During the study period, there were 475 antimicrobial audits and 156 recommendations; the majority of which were accepted (77%). The most common recommendation was to stop the antimicrobial (53%) and vancomycin and piperacillin-tazobactam were the antimicrobials with the greatest number of recommendations (37% and 21%, respectively). Half of the recommendations were for antimicrobials prescribed for sepsis, either rule-out or culture negative. The average DOT/1000 patient-days for aggregate antimicrobial use in the CVICU decreased from 1,172 in the 6 months preceding PAF implementation to 995 over the subsequent 12 months, representing a 15% reduction in utilization. Broad spectrum Gram-negative antibiotic utilization decreased by 8.7% (288 vs. 263 DOT/1000 patient-days) while broad spectrum Gram-positive antibiotic utilization fell by 27% (240 vs. 174 DOT/1000 patient-days) over the same time period.

Disclosures. All authors: No reported disclosures.

1615. Improving Institutional Management of MSSA Infections in Children: A Quality Improvement Initiative
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Session: 169. Stewardship: Pediatric Antimicrobial Stewardship
Friday, October 6, 2017: 12:30 PM

Background. S. aureus is a common cause of skin/soft tissue, musculoskeletal, and bloodstream infections in children, with methicillin susceptible S. aureus (MSSA) accounting for most cases in the U.S. Antibiotic treatment of MSSA with anti-staphylococcal penicillins, or first-generation cephalosporins is associated with improved outcomes compared with treatment with broader spectrum antibiotics. The objective of our study was to analyze current treatment of MSSA infections in our institution, and to implement and assess the effect of interventions to improve appropriate prescribing.

Methods. Retrospective analysis of all children with MSSA positive skin, wound, and blood cultures obtained from the Emergency Department and the inpatient setting between January 1, 2015 to June 30, 2017. Patients undergoing therapy for additional infections and poly-microbial cultures were excluded. A spaced multifaceted quality improvement intervention included medical staff education, modification of notification to MSSA culture results with therapeutic suggestions, and a pharmacy-led pathway for skin/soft-tissue infections (SSTIs). Outcomes measured included proportion of patients prescribed appropriate antibiotic therapy both with and without infectious diseases consultation.

Results. A total of 464 episodes of MSSA infection met our case criterion. Overall during the study period, 33% of patients were switched to appropriate therapy, 62% remained on clindamycin, and 5% were kept on other non-specific therapy. Prior to intervention, appropriate therapy over the 7 pre-intervention quarters measured ranged between 18 and 43%. Post-intervention, appropriate therapy was 45–50% over the next 2 quarters. For inpatient episodes, 92% of cases with ID consultation were switched appropriately, whereas 18% of cases without ID consultation were switched appropriately.

Conclusion. Under current practice habits, a majority of MSSA isolates are treated inappropriately in the absence of ID consultation. Medical staff education can be a beneficial quality improvement focus to improve antimicrobial prescribing for MSSA infections. Antimicrobial suggestions built into laboratory culture reporting and clinical pathways may also be beneficial to improve prescribing.

Disclosures. All authors: No reported disclosures.

1616. Antimicrobial Prescribing Rates Comparing On-Site Visits with Two Types of Virtual Care Visits Across a Large Integrated Healthcare System
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Session: 170. Stewardship: Targets for Intervention
Friday, October 6, 2017: 12:30 PM

Background. In 2014, Carolinas Healthcare System (CHS) implemented virtual visits and Electronic visits (eVisits) as an alternative to on-site visits to provide novel and convenient ways for patients to access care for non-emergent conditions. With virtual visits, patients have a face-to-face consultation with a provider by logging onto any device equipped with a camera. eVisits offer a lower tech alternative that allow patients to email their health concerns through a series of health-related questions. Providers respond via email with recommendations. No face-to-face interaction is included with eVisits. This study aimed to compare prescribing rates across these care delivery options.

Methods. We identified 2,478 virtual visits, 269 eVisits and 655,329 on-site visits between Jan 2014 to Feb 2017 where there was any diagnosis of bronchitis, sinusitis, non-suppurative otitis media and upper respiratory infection. Antimicrobial prescribing rates were standardized to per 100 visits (reported as a %) for each indication. Prescribing rates are reported for each visit type and indication. Chi square tests were used to compare rates across the visit types.

Results. Across all visit types and indications, on-site visits had the highest rate of antimicrobial prescribing and eVisits the lowest (onsite: 55.0; virtual: 51.3; eVisit 33.8; P < 0.001). Sinusitis was the most frequent indication for which an antimicrobial was prescribed, with on-site visits (86.6%), virtual (72.9%) and eVisits (37.8%) showing significantly different rates (P < 0.001). For respiratory infections, where an antimicrobial is not indicated, 34.5% of on-site, 11.0% of virtual and 2.0% of eVisits received an antimicrobial prescription (P < 0.001).

Conclusion. The mechanism of care delivery significantly impacts whether or not an antimicrobial is prescribed for specific diagnoses where a prescription may not be indicated. eVisits had the lowest rates of inappropriate prescribing for URI while
1617. Age-specific Distribution of Antimicrobial Use Surveillance using National Database of Health Insurance Claims and Specific Health Checkups of Japan (NDB Japan) 2011–2013
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Session: 170. Stewardship: Targets for Intervention
October 6, 2017: 12:30 PM

Background. Antimicrobial use (AMU) surveillance is one of the key actions in the Japanese national plan on antimicrobial resistance (AMR). National database of health insurance claims and specific health checkups of Japan (NDB Japan), which archives e-claim big data, is one candidate for their data source, since universal healthcare system is established in Japan and e-claim data covers almost all citizens. However, no study has been performed using NDB for assessing AMU. Our objective was to analyze the quantities and patterns of total systemic antibiotic prescriptions using NDB and to evaluate its utility.  

Methods. The data were analyzed in accordance with the Anatomical Therapeutic Chemical (ATC) classification using defined daily dose (DDD) as a measurement unit, as recommended by the WHO Collaborating Centre for Drug Statistics Methodology. The population-weighted total consumption was normalized and expressed as defined daily doses (DDDs) per 1000 inhabitants per day (DID). Trend analysis of DID from 2011 to 2013 and subgroup analysis stratified by age group (0–14, 15–64, 65 and above years old), and ATC classification were performed.  

Results. The DID value of oral antimicrobial use in 2013 was 13.2, which was a 1.04-fold increase in comparison with that in 2011. The DID value of parenteral antimicrobial use in 2013 was 0.83, which was a 1.13-fold increase in comparison with that in 2011. These data indicate the increasing trend of antimicrobial use in Japan from 2011 to 2013 using the NDB Japan (NDB), which archives e-claim big data, is one candidate for their data source, since universal healthcare system is established in Japan and e-claim data covers almost all citizens. However, no study has been performed using NDB for assessing AMU. Our objective was to analyze the quantities and patterns of total systemic antibiotic prescriptions using NDB and to evaluate its utility.

Disclosures. All authors: No reported disclosures.

1618. Variation in Antibiotic Prescribing among Emergency Departments, Urgent Care Centers, and Retail Health Clinics in the United States, 2014

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Session: 170. Stewardship: Targets for Intervention
October 6, 2017: 12:30 PM

Background. At least 30% of antibiotic courses prescribed in physician offices’ and emergency departments (EDs) are unnecessary, but little is known about other ambulatory settings. The study aimed to assess antibiotic prescribing for acute respiratory conditions across U.S. EDs, urgent care centers (UCs), and retail health clinics (RHs).

Methods. We included visits to EDs, UCs and RHs based on claims from individuals < 65 years old with medical and pharmacy benefits captured in the 2014 Truven MarketScan Commercial Claims and Encounters Database, a convenience sample of employer-based health insurance. Claims for dispensed systemic antibiotics were linked to the most recent ED, UC and RH visit within 3 days for oral antibiotics and on the same day for parenteral antibiotics. Diagnoses were assigned to each visit based on a previously-described tiered system to assign the most likely indication for antibiotics. Antibiotic-inappropriate respiratory conditions (i.e., viral respiratory infections, asthma, and allergy) were identified, and the percent of visits leading to antibiotics was calculated with 95% confidence intervals (CI) by setting.  

Results. In 2014, antibiotics were prescribed in 13.8% (95% CI 13.7–13.9) of 4,954,084 included ED visits, 38.8% (38.8–38.9) of 2,831,950 UC visits, and 36.3% (35.9–36.7) of 5,592,750 RH visits. Antibiotic-inappropriate respiratory conditions accounted for 5.4% of ED visits, 16.4% of UC visits, and 17.2% of RH visits. UCs had the highest percent of antibiotic prescriptions for all antibiotic-inappropriate respiratory conditions (45.3%, 95% CI 45.2–45.5), followed by EDs (24.5%, 24.3–24.6) and then RHs (14.4%, 13.8–15.1). This pattern persisted when examined by diagnosis (figure).

Conclusion. Antibiotic prescribing for antibiotic-inappropriate respiratory infections was common in these settings. UCs are a particularly important target for antibiotic stewardship.

Disclosures. All authors: No reported disclosures.

1619. Pharmacoepidemiology of Antibiotic Prescribing Among 135,000 Adult Outpatient Encounters in Northeast Ohio

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Session: 170. Stewardship: Targets for Intervention
October 6, 2017: 12:30 PM

Background. Nearly 154 million ambulatory visits in the United States result in an outpatient antibiotic prescription (OAP) annually, 30% of which are unnecessary. Remaining prescriptions may benefit from improved antibiotic selection. At our institution, a quarterly OAP report associated with 4 common encounter diagnoses was developed. The objectives of this study were to assess OAP rate for each diagnosis, and to assess the rate of guideline-concordant selection when an OAP was issued.  

Methods. OAP report from January 2016 – March 2017 was queried to conduct a retrospective pharmacoepidemiology study including data from 106 outpatient sites, 33 care institutes, and 1400 providers in Northeast Ohio. The report aggregated OAPs for all office and telephone encounters with a diagnosis code for otitis media, pharyngitis, sinusitis, or urinary tract infection. For each diagnosis, encounters that resulted in an OAP were then categorized as guideline-concordant or –discordant based on the antibiotic selections. The study also considered the risk of labeled penicillin allergy and consensus guideline recommendations (Figure 1). All data were filterable to the practice site, care institute, or prescriber level.

Results. A total of 135,177 patient encounters were captured during the study period (9766 otitis media, 3957 pharyngitis, 60940 sinusitis, 24901 urinary tract infection). Mean patient age was 50 (±15) years. At least 1 OAP was issued in 8444 (86%) otitis media, 16143 (41%) pharyngitis, 46343 (76%) sinusitis, and 15464 (62%) urinary tract infection encounters. For encounters in which an OAP was issued, the rate of guideline-concordant antibiotic selection by diagnosis was 46% for otitis media, 58% for pharyngitis, 64% for sinusitis, and 50% for urinary tract infection. Antibiotic selection for pharyngitis and sinusitis during Q1 2017 are detailed in Figures 2 and 3, respectively.

Conclusion. Audit of outpatient prescribing data revealed a high rate of OAP issuance for these four common diagnoses. The use of guideline-discordant antibiotics was also prevalent and commonly consisted of macrolides, fluoroquinolones, tetracyclines, and cephalosporins. These data provide an important baseline that underscores the need for outpatient stewardship and facilitates targeted prospective interventions.

Disclosures. All authors: No reported disclosures.

Figure. Percent of visits for antibiotic-inappropriate respiratory conditions leading to antibiotic prescriptions according to diagnosis by setting — United States, 2014.