Clinical Predictors for Pediatric Antimicrobial Stewardship Recommendations

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Methods

• Antimicrobial stewardship programs (ASP) are increasing in pediatric hospitals.
• Prospective audit and feedback (PAF) programs function by reviewing antimicrobial prescriptions after they have been ordered to identify opportunities to improve or modify prescribing.
• Little is known about the frequency with which reviewed prescriptions lead to an ASP recommendation in a pediatric PAF ASP.
• Evaluation of ASPs is critical to better understand resource allocation and identify areas of high and low stewardship interaction. This information may aid other stewardship programs, especially those that might be less well resourced or early in development, to understand where to target efforts.
• The primary objective of this study was to determine the antimicrobials and clinical diagnoses most strongly associated with a pediatric ASP recommendation.
• The secondary objective was to determine the likelihood of recommendation agreement by the prescribing clinician.

Study Design:
• A PAF ASP was implemented at Children’s Mercy Hospital on March 3, 2008. An ASP review occurs when an ASP monitored antibiotic (Table 1) has been prescribed for 2 consecutive calendar days. An ASP pharmacist and/or infectious diseases physician reviews the medical chart to determine the appropriateness of all antibiotics the patient is receiving in regards to the indication, dose, and duration. Based on the review, the ASP may or may not provide a recommendation concerning antibiotic prescribing to the primary team caring for the patient. All reviews and associated recommendations are entered into a database.

Results

• The diagnoses most predictive of an ASP recommendation were:
  - diagnoses: ENT infections (0.03) and F&N infections (0.09)
  - antibiotics: Broad spectrum (e.g. carbapenems, linezolid) (0.5), ASP drug + penicillin (0.7)

• The most common recommendations were:
  - no recommendation: linezolid (0.05), ASP drug + penicillin (0.7)
  - modify therapy: vancomycin (0.01)

Discussion

• Commonly prescribed antibiotics resulted in a relative high utilization of stewardship resources, yet the reviews also resulted in a high proportion of recommendations. Conversely, less frequently reviewed drugs such as 3rd generation cephalosporins, linezolid, fluoroquinolones and vancomycin were less predictive of an ASP recommendation.
• The diagnoses most predictive of an ASP recommendation are frequently diagnostic challenges resulting in variability among clinical interpretation and treatment strategies (e.g. tracheitis, CAP).
• Prescribing clinicians agree with ASP recommendations the majority of the time; however further evaluation of cases when disagreement occurs is warranted as additional areas for stewardship enhancement may be identified.
• Assessment of commonly encountered diagnoses associated with a stop therapy recommendation is needed. In addition, formalizing the prior approval process may make our program more effective.