Antibiotic Stewardship: Monitoring Antibiotic Use in Children with Viral Respiratory Infections in a Community Hospital

Amrita Singh, MD; Huay-ying Lo, MD; Megan James, RN, BSN; Kelli Kulik, PharmD; Samrah Mobeen, PharmD, RPh; Ankhi Dutta, MD, MPH
Department of Pediatrics, Baylor College of Medicine & Texas Children's Hospital, Houston, TX

Baylor College of Medicine

Texas Children's Hospital
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Background

- Viral respiratory tract infections (VRTIs) in children lead to substantial healthcare utilization and costs.
- Despite American Academy of Pediatrics (AAP) recommendations against antibiotic use for VRTIs, antibiotic overuse of 29-80% has been reported, which has contributed to increased prevalence of multidrug resistant organisms (MDROs).
- Antibiotic Stewardship Programs (ASPs) have emerged to decrease antibiotic overutilization and associated costs.
- At our institution, an ASP program developed during the 2018-19 RSV season was successful in decreasing antibiotic days of therapy (DOT) as well as broad spectrum antibiotic use.
- For the 2019-20 season, our goal was to sustain ASP program successes and expand the project to all PCR positive VRTIs.

Methods

- ASP interventions developed in 2018 included:
  - AAP guidelines emailed to all providers
  - Utilized previously developed, validated communication tool with TeamSTEPPS 2.0 principles
  - Audit-feedback technique
  - ASP dashboard for tracking
  - Weekly ASP rounds with Infectious Disease and pharmacists
- In 2019, ASP activities continued and retrospective chart review was performed on hospitalized patients with PCR positive VRTIs from October 2019 to March 2020.
- Metrics included percentage of patients on antibiotics, percentage justified antibiotics, antibiotic DOT/1000 patient days, and ceftriaxone use.
  - Justified antibiotics were defined as those started for rule out sepsis evaluations, culture positive bacterial infections, clinical or radiologic evidence of pneumonia, and documented otitis media.

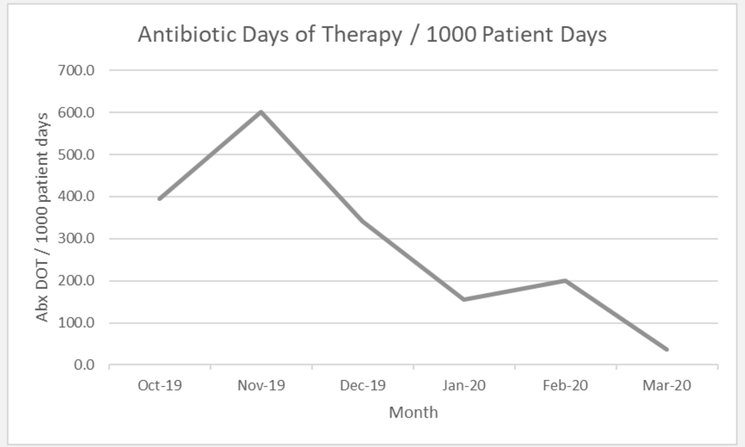
Results

	Total Patients	% Antibiotic Use	% Justified
Oct-19	70	58.6%	95.1%
Nov-19	89	49.4%	90.9%
Dec-19	53	60.4%	90.6%
Jan-20	32	56.3%	100.0%
Feb-20	27	48.1%	84.6%
Mar-20	9	33.3%	100.0%

- Overall antibiotic utilization among hospitalized patients with PCR positive VRTIs was 53%, which was stable from the previous year.
- 91% of antibiotic utilization was classified as justified based on clinical documentation from manual chart review.
- For patients started on antibiotics for rule out sepsis evaluations, antibiotics were discontinued after 48 hours in 63% of patients.
- Antibiotic DOT/1000 patient days steadily decreased from October 2019 to March 2020.
- For patients with community acquired pneumonia, ceftriaxone was utilized in 48% of patients

Demographic data for 2019-2020 patients

Gender	
Male	58.6% (n=164)
Female	41.4% (n=116)
Race	
Caucasian	43.9% (n=121)
African-American	18.6% (n=52)
Latino/Hispanic	34.6% (n=97)
Other	2.9% (n=8)
Age in months (median, IQR)	7 (3, 32)
Length of Stay in days (median, IQR)	2.86 (1.76, 4.94)
Hospital Unit	
Acute Care	65.4% (n=183)
Pediatric Intensive Care Unit	34.3% (n=96)



Conclusions

- ASP interventions implemented in 2018-19 were successfully sustained through the 2019-20 viral season, and antibiotic utilization monitoring was expanded to all PCR positive VRTIs.
- ASP interventions were successful in decreasing antibiotic DOT/1000 patient days for children hospitalized with PCR positive VRTIs.
- Although antibiotic utilization for these children remained stable at 54%, it was deemed appropriate based on expert review >90% of the time.
- Next steps:
  - Re-evaluate criteria for 'justified' antibiotics to continue decreasing overall antibiotic utilization, which remains high compared to peer institutions.
  - Increasing narrow spectrum antibiotic use for community acquired pneumonia.