



Pediatric Community-Onset *Staphylococcus aureus* Susceptibility Trends in a Multi-Hospital System

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BACKGROUND

Hospitalizations due methicillin-resistant *S. aureus* (MRSA) infections are decreasing in children.¹⁻² Analyzing trends in pediatric community-onset (CO) *S. aureus* antibiotic susceptibilities is needed to inform empiric antibiotic selection in the Emergency Department and outpatient settings.

OBJECTIVES

We aimed to describe trends in pediatric community-onset *Staphylococcus aureus* antibiotic susceptibilities within a multi-hospital health system between 2015-2020.

METHODS

- Multi-hospital, retrospective study of temporal trends in *S. aureus* antibiotic susceptibilities
- Identified bacterial cultures growing *S. aureus* obtained from patients less than 18 years of age between January 1, 2015 and December 31, 2020
- Inclusion: first clinical culture per patient per year and cultures obtained within 3 calendar days of hospitalization or from children not hospitalized
- Exclusion: cultures that likely represented colonization
- Cochran-Armitage test was used to analyze trends in antibiotic susceptibilities. Data were analyzed using R (R Center for Statistical Computing, Vienna, Austria). This study was approved by the Johns Hopkins University Institutional Review Board.

RESULTS

Table 1: Demographics of patients with community-onset *S. aureus* cultures who met criteria for inclusion

	Number	Percent
Patient Characteristics		
Total patients	2,220	
Race		
Black	958	43.2
White	813	36.6
Asian	92	4.1
Other/Unknown	357	16
Ethnicity		
Non-Hispanic	1916	86.3
Hispanic	267	12
Other	37	1.7
Age ^a	6.9 (+/- 5.7)	
Sex		
Male	1176	53
Female	1043	47
Other	<5 patients	
Culture Characteristics		
Total cultures	2,387	
MRSA	780	32.7
Culture Source		
Abdomen	7	0.3
Soft tissue	1508	63.2
Soft tissue, surgical	75	3.1
Central nervous system	5	0.2
Urinary	72	3
Deep respiratory	63	2.6
Respiratory	252	10.6
Blood	130	5.4
Bone/Joint	72	3
Ear, sinus, nasal	134	5.6
Other	69	2.9
Collection Department		
Emergency Department	1323	55.4
Hospital	662	27.7
Clinic	361	15.1
Other	39	1.6
Management		
Inpatient	1,035	43.4
Outpatient	1,352	56.6

a: Mean with standard deviation

Figure 1: Trends in community-onset *S. aureus* cultures with 95% confidence intervals

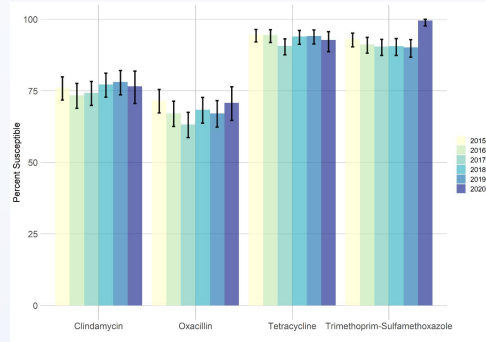
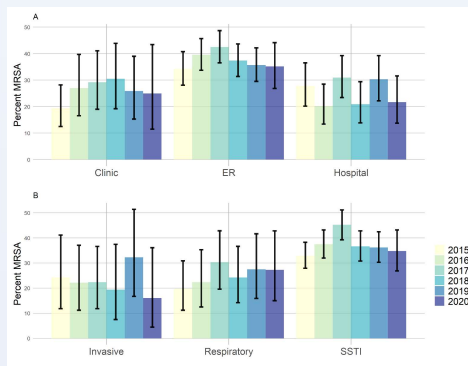


Figure 2: Trends in community-onset MRSA stratified by collection location (A) and source (B) with 95% confidence intervals



CONCLUSIONS

- Oxacillin and clindamycin susceptibility remained low at 67% and 75%, respectively
- Tetracycline and trimethoprim-sulfamethoxazole susceptibility remained high at >90%
- Trimethoprim-sulfamethoxazole susceptibility increased after JHH Microbiology changed testing platforms in 2019 due to reports that a commercial platform overestimated trimethoprim-sulfamethoxazole resistance.⁵
- Prevalence of MRSA was highest in SSTIs and cultures obtained in the ER
- The majority of invasive infections were MSSA, which is consistent with other studies.³⁻⁴ Further surveillance studies are needed to identify prevalent MSSA strains and virulence factors.
- Anti-MRSA therapy is still required for empiric treatment of CO *S. aureus* infections within this region

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