

**PUBLISHED ABSTRACT**

# Pediatric Skin and Soft Tissue Infection Antibigram and Antibiotics Prescription Pattern in the Pediatric Emergency and In-patient Settings

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## Background

Antimicrobial resistance has posed significant challenge to effective treatment of pediatric skin and soft tissue infections (SSTIs) in the past two decades with significant demographic variations. The AAP Committee on Infectious Disease recommends tracking of local antibiotic resistance patterns, judicious use of empiric antibiotics in line with resistance patterns and antibiotic stewardship to combat this challenge.

## Objectives

Characterization of pediatric SSTI antibiogram and antibiotic prescription pattern, with specific evaluation of MRSA prevalence, antibiotic resistance and prescription patterns.

## Methods

We conducted a retrospective review of patients aged 0–21 years seen at the Emergency and In-patients units of the BronxCare Health System from Jan. 2013 to Dec. 2016. Study was IRB-approved and data was collected using ICD-9 and 10 codes for key words. Specific information about patient demographics, type of SSTI, empiric antibiotics prescribed, culture results and antibiotic sensitivities were obtained from the EHRs. Data was analyzed using SAS 9.3® with bivariate comparison tested at  $\alpha = 0.05$  significance level. The antibiogram was created with the WHONET software.

## Results

Records for 2872 children were reviewed – 52% were females, mean age was 10 years, and 75% self-identified as Black or Hispanic. The majority (80%) presented with abscess or cellulitis with mean size of 4.0cm, predominantly affecting the extremities (31%), gluteal and groin regions (14%) and head and neck regions (10%). Seventy-one percent (71%, n = 574) of 811 cultures sent were positive, with *Staphylococcus aureus* and *Group A Streptococcus* reported in 83% and 5% of positive cultures, respectively. The prevalence of methicillin-resistant *S. aureus* (MRSA) was 28% (39% of positive cultures), with 18% of MRSA demonstrating inducible Clindamycin resistance. MRSA was 99.1% sensitive to TMP-SMX. During the period under review, there was a trend towards decreasing sensitivity of MRSA to clindamycin (from 93% to 75% with  $p = 0.071$ ). Despite the observed pattern, clindamycin constituted 70% of all empiric antibiotics prescribed, with only 1.0% receiving TMP-SMX at their initial encounter.

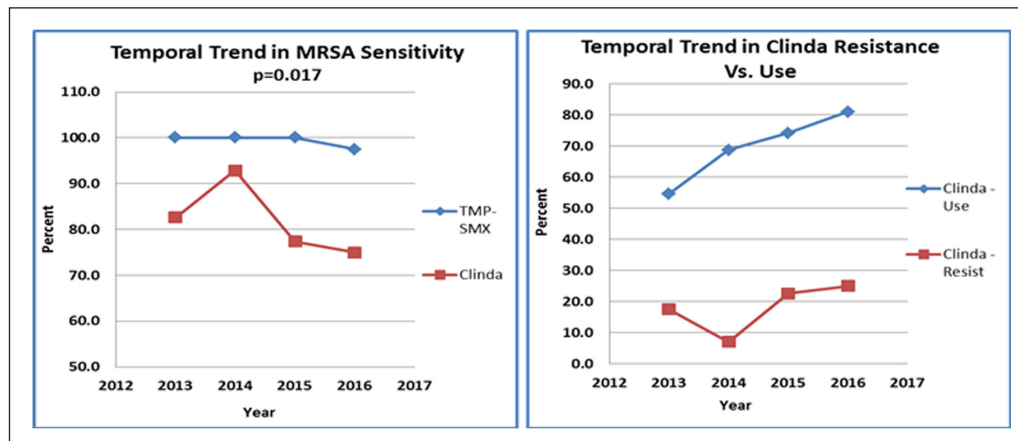
**Table 1:** Temporal Trend in MRSA Resistance.

<b>P<sub>Trend</sub> = 0.036</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>
<b>Clinda – R</b>	12 (17.5%)	4 (7.0%)	12 (22.6%)	11 (25.0%)
<b>Clinda – S</b>	57 (82.6%)	53 (92.9%)	41 (77.4%)	33 (75.0%)
<b>TMP-SMX – R</b>	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (4.8%)
<b>TMP-SMX – S</b>	69 (100.0%)	57 (100.0%)	51 (100.0%)	40 (97.2%)

Abbreviations – Clinda: Clindamycin, TMP-SMX: Trimethoprim-Sulfamethoxazole, R: Resistance, S: Sensitive.

**Table 2:** Temporal Trend in Empiric Antibiotics Prescription Pattern.

$P_{trend} = <0.001$	2013	2014	2015	2016
<b>Augmentin</b>	33 (7.7%)	28 (6.9%)	24 (4.8%)	13 (3.4%)
<b>TMP-SMX</b>	8 (1.9%)	7 (1.7%)	2 (0.4%)	3 (0.8%)
<b>Clindamycin</b>	235 (54.7%)	278 (68.8%)	368 (74.2%)	312 (81.0%)
<b>Cephalexin</b>	110 (25.6%)	69 (17.1%)	73 (14.7%)	46 (11.9%)
<b>All Antibiotics</b>	430	404	496	385



**Figure 1.**

**Conclusion**

Our data shows a high prevalence of MRSA in this population of children with SSTI, with an increasing resistance to Clindamycin, but excellent sensitivity to TMP-SMX. Despite these patterns, clindamycin remains the predominant empiric antibiotic prescribed for SSTIs in the Pediatric ED and In-patient settings. Clinicians should consider utilizing local antibiogram in prescribing empiric antibiotics, and also follow culture results to make appropriate antibiotic changes for effective clinical response.

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