Institutional antibiograms are insufficient to guide clindamycin use in pediatric skin and soft tissue infections

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Background & Methods

- Clindamycin (CLN) is commonly used for empiric treatment of infections likely to be *S. aureus* (SA) in children, despite decreasing susceptibility on institutional antibiograms
- In 2017, Children's Hospital of Michigan's (CHM) SA antibiogram showed that MRSA was 80% susceptible, and MSSA was 82% susceptible to clindamycin.
- Clindamycin is a tolerable, convenient, and cost-effective antibiotic for use in pediatric community-acquired (CA) infections, and previous literature has shown that community-acquired infections tend to be more susceptible to clindamycin than healthcare-associated community-onset infections

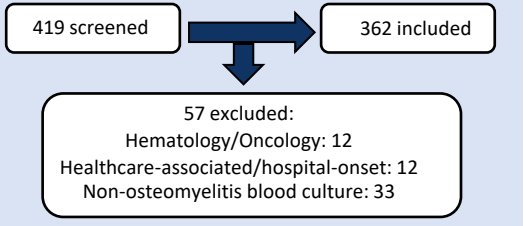
Study Objectives
- Describe rates of clindamycin resistance by infection type
- Identify predictors of clindamycin resistance

Study Design
- Single-center retrospective chart review approved by the Wayne State University Institutional Review Board
- Patients aged ≤ 18yrs with CA-SA infections in 2016 and 2017 were eligible for inclusion. Patients admitted to the hematology/oncology service as well as those with bloodstream and respiratory infections were excluded.

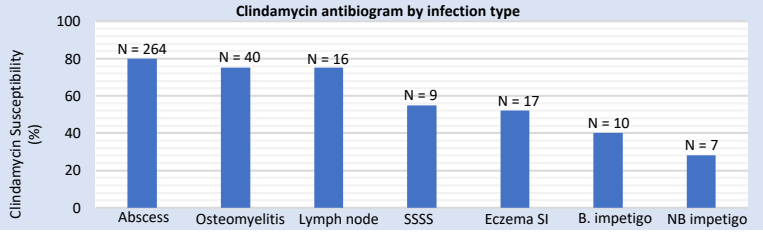
Study Phase 1
- All isolates of included patients are evaluated for CLN susceptibility and included in an antibiogram governed by infection type

Study Phase 2
- Case-control analysis comparing characteristics of patients infected with CLN-S and CLN-R SA
- Multivariate analysis for characteristics with $p < 0.2$ from the univariate analysis

Subject Inclusion



Phase 1 Results



Phase 2 Results

Univariate Analysis: Demographics and Infection Types

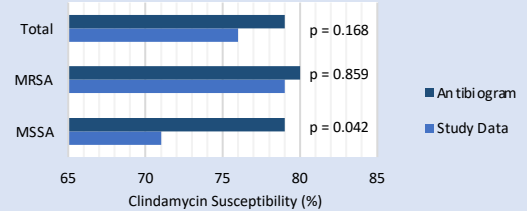
	Clinda-S (n=274)	Clinda-R (n=88)	P-value
Demographics			
African American, n (%)	173 (63.1%)	59 (67%)	0.506
Male, n (%)	129 (47.1%)	45 (51.1%)	0.508
Age, years (mean +/- SD)	5.4 +/- 5.3	6.4 +/- 12.2	0.274
Comorbidities			
Recurrent CA-SA, n (%)	47 (17.2%)	9 (10.2%)	0.118
Daycare, n (%)	11 (4%)	1 (1.1%)	0.307
Immunosuppression, n (%)	8 (2.9%)	4 (4.5%)	0.496
Diabetes, n (%)	1 (0.4%)	1 (1.1%)	0.428
Burn/Trauma, n (%)	7 (2.6%)	4 (4.5%)	0.473
Eczema, n (%)	35 (12.8%)	15 (17%)	0.312
Contact, n (%)	32 (11.7%)	18 (20.5%)	**0.038**
Infection Type			
Abscess, n (%)	213 (77.7%)	51 (58%)	**< 0.001**
Bullous impetigo, n (%)	4 (1.5%)	6 (6.8%)	**0.016**
Non-bullous impetigo, n (%)	2 (0.7%)	5 (5.7%)	**0.011**
Eczema superinfection, n (%)	9 (3.3%)	8 (9.1%)	**0.039**
Osteomyelitis, n (%)	30 (10.9%)	10 (11.4%)	0.914
Lymph node, n (%)	12 (4.4%)	4 (4.5%)	> 0.999
SSSS, n (%)	5 (1.8%)	4 (4.5%)	0.229
Clinical Presentation			
Diaper area, n (%)	45 (16.4%)	16 (18.2%)	0.701
Fever, n (%)	90 (32.8%)	30 (34.1%)	0.829
High WBC, n (%)	104 (38%)	20 (22.7%)	**0.009**
Hypotensive, n (%)	15 (5.5%)	15 (17%)	**0.001**

Phase 2 Results

Analyzing predictors of clindamycin susceptibility

Variable	OR	95% CI	P-value
Recurrent	1.748	0.782-3.904	0.173
Contact	0.468	0.231-0.948	**0.035**
Abscess	3.883	2.628-5.738	**< 0.001**
Bullous	0.76	0.202-2.868	0.686
Non-bullous	0.439	0.084-2.285	0.328
Eczema SI	0.875	0.312-2.45	0.799
WBC	2.482	1.435-4.293	**0.001**
Hypotensive	0.312	0.138-0.703	**0.005**

Clindamycin susceptibility of study data vs. antibiogram



Discussion & Conclusions

- Susceptibility of SA isolates recovered from skin abscesses was 80%. Some infection types such as osteomyelitis and eczema superinfections were more resistant than the institutional antibiogram showed
- It is worth examining distribution of MRSA and MSSA between infection types, since this data shows that CA-MSSA was more likely to be CLN-R compared to the institutional antibiogram, which includes all SA isolates
- Abscess was a predictor of CLN-S, and contact with a person with an abscess was a predictor of CLN-R
- Empiric therapy should be driven by predicted susceptibility based on patient characteristics and infection type and not by the antibiogram alone

References

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