Analysis of *Staphylococcus aureus* resistance patterns and antibiotic prescribing practices in a single tertiary pediatric center in South Florida

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Background:

- *Staphylococcus aureus* antibiotic resistance is a dynamic process associated with high morbidity
- **Objectives:**
  - To describe the antibiotic susceptibility of *S. aureus* from 2008 to 2019
  - To compare antibiotic resistance patterns between MRSA and MSSA isolates.
  - To determine the rate and frequency of antibiotic prescribing

Methods:

- **Retrospective observational** study of non-duplicated clinical isolates collected from 2008 to 2019 of *S. aureus* collected at NCH
- Based on the Clinical and Laboratory Standards Institute (CLSI) Guidelines via disc diffusion
- Outpatient and ED antibiotic prescription data from 2013 to 2019 and patient encounter visits were collected from **electronic medical records**
- The **statistical analysis** included descriptive statistics, t-student, Pearson's correlation and linear regression. Significance was considered when a two-tailed $p<0.05$

Results:

- **11,964 clinical** isolates were included in the study
- **Methicillin resistance** was present in 47.9% (±0.63) of isolates with no significant temporal trend.
- Resistance to **rifampin, TMP-SMX, vancomycin** and **linezolid** remained **<2%**
- No cases of **VISA** or **VRSA** were detected.

Results:

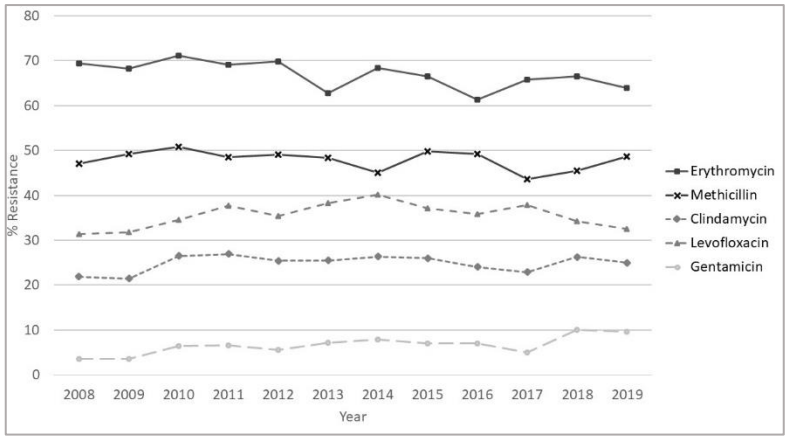

Figure 1. Annual Resistance Rate Among *S. aureus* Isolates 2008-2019

- **MRSA** had **higher resistance rates** to most antibiotics than MSSA ($p<0.05$) except for clindamycin for which both had similar rates.

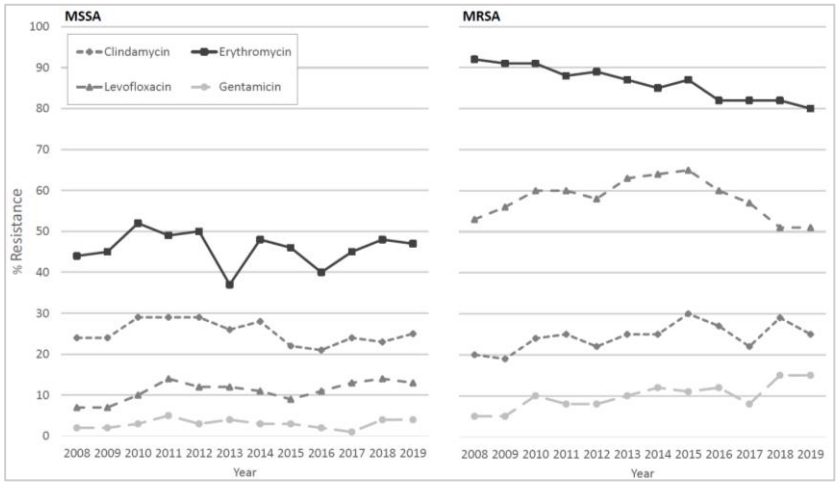

Figure 2. Comparative Annual Resistance Rate Among MSSA and MRSA Isolates 2008-2019

Results:

- **Antibiotic prescription** rate increased from 56 prescriptions per 1,000 patients to 136 prescriptions per 1,000 patients from 2013 to 2019.

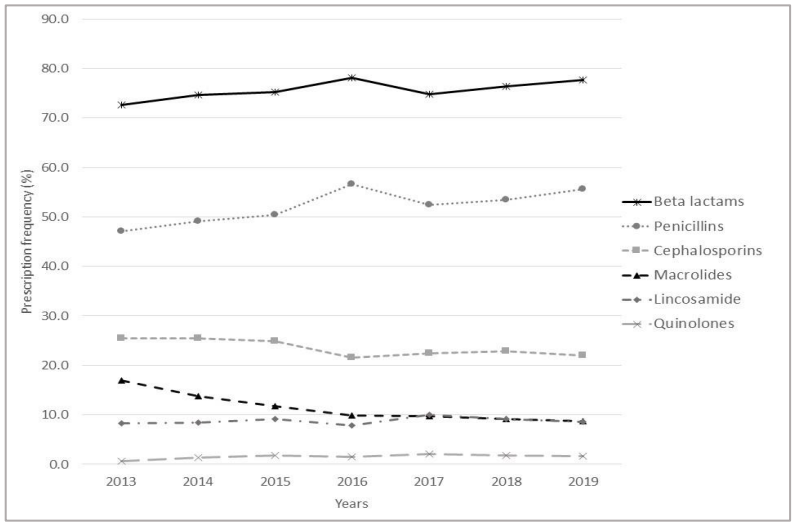

Figure 3. Annual Antibiotic Prescription at NCH, 2013-2019

Conclusions:

- Methicillin resistance is present in **almost half of all** clinical isolates limiting the use of beta-lactams as first line treatment. MRSA and MSSA have different resistance patterns that should be taken into consideration when treating these infections
- Clindamycin resistance is present in nearly **one fourth** of all isolates **and growing in MRSA**, limiting its use
- Trimethoprim-sulfamethoxazole, vancomycin and linezolid remain acceptable alternatives for the treatment of MRSA infections
- **Antibiotic prescribing is on the rise** in our center and efforts to limit them should be implemented