Community Acquired MRSA Infections
(Guess What, it’s NOT a Spider Bite!)

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CaMRSA Infections

• Epidemiology: U.S., Texas, Central Texas
• The Bug
• How Does It Present?
• Antimicrobial Sensitivity Data
  – Modes of Resistance
  – Appropriate drugs for therapy
Ca-MRSA Infections

• No identifiable traditional risk factors:
  – known chronic disease
  – chronic care facility residence
  – recent hospitalization
  – previous antibiotic therapy, IV drug use

  – If hospitalized, those identified within 48h of admission
  – Outpatient setting MRSA diagnosis
  – Majority of children hospitalized with CaMRSA infections have no identifiable risk factor.

Layton MC. Infect Control Hosp Epidemiol 1995;16: 12-17
CDC: MRSA Fact Sheet; www.cdc.gov
Ca-MRSA Infections: Epidemiology

- Australia: early 1990s, USA late 1990s
- Worldwide. NOT a single clone
- South Texas Children: proportion of Ca-MRSA increased from 12% to 80% over 10 years (1990-2000)
- Houston: Fall 2002; Austin: Fall, 2003
- Estimated 30-50% nasal colonization rates in various populations

Fergie PIDJ 2002: 21 (10):988
Bratcher D PIDJ 2001:20 (12):
EID 2003;9 (8):962
MRSA Infections: Epidemiology
Central Texas

By 2007 64% of all S. aureus strains were MRSA
MRSA Infections: Epidemiology
Central Texas

Inpatient vs Outpatient MRSA Isolates

- Inpt MRSA
- Inpt MSSA
- Outpt MRSA
- Outpt MSSA

<table>
<thead>
<tr>
<th>Year</th>
<th>Inpt MRSA</th>
<th>Inpt MSSA</th>
<th>Outpt MRSA</th>
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<tbody>
<tr>
<td>2006</td>
<td></td>
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<td>2007</td>
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<tr>
<td>2008</td>
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CHOA/DCMC  Outpatient Abscess I/D Data  
(Annual Jan - Dec)
CHOA/DCMC *S. aureus* Blood Culture Data Annual July-June

For 2007 and 2008, + BC for *S. aureus* = 1% of total drawn
Staph vs strep gram stain
Is Ca-MRSA a “Badder” Bug?

• Methicillin resistance carried by mecA gene in a family of mobile genetic elements (Staphylococcal cassette chromosome): implications for community spread

• Appears to have faster doubling times

• Panton-Valentine Leukocidin (PVL)
  – Toxic effects on human WBC
  – Associated with necrotic lesions of tissues/necrotizing pneumonia

Lancet 2002:359:1820
CID 1999:29-1131
S. Aureus Buttock Carbuncle with cellulitis

Cohen & Powderly: Infectious Diseases, 2nd ed
Staphylococcal pyoderma
Staphylococcal Empyema and Necrotizing Pneumonia

Gershon: Krugman's Infectious Diseases of Children, 11th ed.
Myositis, adductor muscle

Cohen & Powderly: Infectious Diseases, 2nd ed.
Pelvic osteomyelitis of the left iliac bone
Ca-MRSA Strains: Why Are They Different from MRSA strains?

• *NOT* multi drug resistant:
  – Usually susceptible to multiple antibiotics, *except* B-lactam drugs, erythromycin.
  – Usually maintain susceptibility to Clindamycin, Trimethoprim-sulfamethoxazole, tetracyclines, quinolones, vancomycin, linezolid, daptomycin.

Infect Med 2003;20 (1):8
DCMC *S. aureus* Antibiogram (% Susceptible)

<table>
<thead>
<tr>
<th>S. aureus isolates 2007</th>
<th>n</th>
<th>oxacillin</th>
<th>Vanc omycin</th>
<th>erythromycin</th>
<th>clindamycin</th>
<th>D – test (% +)</th>
<th>Trim/Sulfa</th>
<th>Ciprofloxacin</th>
<th>Tetacycline</th>
<th>Minocycline</th>
<th>Rifaximin</th>
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<tr>
<td>MRSA</td>
<td>607</td>
<td>0</td>
<td>100</td>
<td>11</td>
<td>82</td>
<td>2</td>
<td>100</td>
<td>94</td>
<td>96</td>
<td>97</td>
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<tr>
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**D test**

D test: test for Inducible resistance to Clindamycin; use in discordant strains; Recommended to perform by NCCLS since 2004

Two discs, on L, Erythromycin, on R, clindamycin on lawn on *S. aureus*: Blunting of the zone forming a "D" shaped zone around clindamycin indicates inducible resistance to clindamycin. Reported as Positive for inducible clindamycin resistance.
Ca-MRSA Therapy

“ The Right Drug For The Right Bug”

- When you think of S. aureus, now think MRSA
- Oral penicillins, cephalosporins, and erythromycins are NOT good choices
- Clindamycin is an effective agent: caveat D test
- Trimethoprim-Sulfamethoxazole, Tetracyclines are good choices
- Double drug therapy: in special scenarios: NEVER use Rifampin alone
- Newer drugs
Ca-MRSA

References

• Bratcher D. MRSA in the Community PIDJ 2001:20 (12)
• CDC: MRSA Fact Sheet; www.cdc.gov
• CID 1999:29-1131
• EID 2003;9 (8):962
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• Gorak EJ CID 1999;29-797
• Layton MC. Infect Control Hosp Epidemiol 1995;16: 12-17
• Lancet 2002:359:1820
• Infect Med 2003;20 (1):8
  Purcell K et al. Exponential increase in Ca-MRSA in South Texas children 2002 PIDJ 21(10)988-989