Prevalence and Epidemiology of Mupirocin Resistance Among Those Colonized with Methicillin-resistant *Staphylococcus aureus* in the Community

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**Background**

- *Staphylococcus aureus* the most common cause of purulent skin and soft tissue infections (SSTI) in the United States
- Methicillin-resistant *S. aureus* (MRSA) makes up the majority of strains
- To prevent recurrent MRSA SSTI, there has been increased use of mupirocin to eradicate MRSA colonization in patients and their families
- Mupirocin resistance among community-onset MRSA strains, has been increasing
- High-level mupirocin resistance (HLMR; minimum inhibitory concentrations (MICs) >512 µg/mL) associated with decolonization failure
- HLMR predominantly associated with presence of *mupA* gene, carried on conjugative plasmids
- Plasmids also can carry resistance determinants to other antimicrobial agents

**Objective**

To describe the prevalence and epidemiology of HLMR among community-dwelling adults and children colonized with MRSA

**Design**: Prospective cohort study from January 1, 2010 through December 31, 2012

**Setting**: Five adult and pediatric academic medical centers in Southeastern Pennsylvania

**Subjects**: Adults and children presenting to the Emergency Departments and primary care settings with an acute MRSA SSTI and their household members

**Methods**: Subjects performed self-sampling for MRSA from three anatomic sites (nares, axillae, groin) every two weeks for six months. Mupirocin MIC determined using Etest®.

**Analysis**: Isolates with HLMR compared to susceptible isolates on the basis of staphylococcal cassette chromosome (SCC)me type, spa type and susceptibilities to other antimicrobials using χ² test

**Results**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Susceptible N=413</th>
<th>HLMR N=19</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clindamycin resistance</td>
<td>38 (9.2)</td>
<td>8 (42.1)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>TMP-SMX resistance</td>
<td>0 (0)</td>
<td>0 (0)</td>
<td>NA</td>
</tr>
<tr>
<td>SCCmec type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>235 (56.7)</td>
<td>11 (57.9)</td>
<td>0.91</td>
</tr>
<tr>
<td>II</td>
<td>180 (43.3)</td>
<td>8 (42.1)</td>
<td>0.90</td>
</tr>
<tr>
<td>spa type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>t008</td>
<td>297 (71.9)</td>
<td>8 (42.1)</td>
<td>0.005</td>
</tr>
<tr>
<td>t002</td>
<td>11 (2.7)</td>
<td>1 (5.3)</td>
<td>0.50</td>
</tr>
<tr>
<td>t024</td>
<td>11 (2.7)</td>
<td>0 (0)</td>
<td>0.47</td>
</tr>
<tr>
<td>other</td>
<td>45 (10.9)</td>
<td>8 (42.1)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

**Discussion**

- HLMR is associated with clindamycin resistance in MRSA surveillance culture isolates
- May be related to carriage of multiple resistance determinants on plasmids
- Mupirocin use may select for increased resistance in MRSA
- No difference seen between SCCmec types in terms of HLMR rates
- spa type t008 was most commonly seen, but more commonly associated with mupirocin susceptible strains
- Future studies needed to determine the rate of development of cross-resistance to other antimicrobials with mupirocin use

**References**


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