SAVING FACE: A VIRULENT, COMMUNITY-ASSOCIATED MRSA CELLULITIS

Cathy I. Cheng, MD and Gregory P. Melcher, MD
1Department of Internal Medicine, University of California Davis Medical Center, Sacramento, CA

INTRODUCTION

- Health care-associated methicillin-resistant Staphylococcus aureus (HA-MRSA) is no stranger in nosocomial settings, but community-associated (CA) MRSA is less well known
- CA-MRSA, through a gene named Panton-Valentine Leukocidin (PVL), can cause particularly virulent, recurrent infections in otherwise healthy, community-dwelling individuals

LEARNING OBJECTIVES

- To know when to suspect that a cellulitis may be caused by PVL-positive CA-MRSA
- To understand the hypothesized pathophysiology of the virulence characteristic of PVL-positive CA-MRSA
- To learn the differences between CA- and HA-MRSA
- To understand the different options for empiric treatment of suspected CA-MRSA

CASE DESCRIPTION

- 34-year-old woman presented to ED with facial edema and erythema
- Three days prior to presentation, pt noticed two pimples (similar to Figure 1) on her left cheek and right lower face with associated erythema and edema. Warm compresses for two days did not lead to resolution
- On the day of presentation, pt’s left cheek and right lower face lesions progressed suddenly to the sizes of tennis and ping-pong balls, respectively
- Pt had two past episodes of pimples that developed rapidly into MRSA abscesses requiring I&D. Denied intravenous drug use. Had household contacts with similar skin abscesses
- In the ED, vital signs were notable for HR 99 bpm. Physical exam notable for edema and erythema involving her left cheek, nose, neck, and periorbital region, plus right lower face
- Initial labs notable for WBC 12.8 with 76% neutrophils
- CT sinuses, face, and neck (Figure 2) performed in the ED revealed facial cellulitis without abscesses
- Pt was admitted to the Medicine service and treated with IV vancomycin. By HD3, edema and erythema decreased, drained spontaneously, and grew MRSA
- Pt was discharged on HD4 with clindamycin for a total 14 days of antibiotics. Pt and her family were advised to attempt MRSA decolonization with chlorhexidine body washes daily and intranasal mupirocin bid for five days to prevent reinfection and transmission

DISCUSSION

- There is a specific type of virulent cellulitis that is caused by PVL-positive CA-MRSA, which can also cause other diseases ranging from minor skin infections to fatal necrotizing pneumonias
- Unlike HA-MRSA, PVL-positive CA-MRSA classically affects young, otherwise healthy pts and typically begins as folliculitis that can transmogrify quickly to severe cellulitis or abscess, which often recurs. Based on her classic presentation, our pt likely had PVL-positive CA-MRSA. Many other key differences exist between CA-MRSA and HA-MRSA (Table 1)
- The pathogenesis of PVL-positive CA-MRSA may occur by pvl gene products forming heterooligomer cytotoxins, which create pores on leukocyte membranes and cause apoptosis or lysis of PMNs (Figure 3). Reactive oxygen species and granule contents triggering an inflammatory response are then released from lysed PMNs to cause tissue necrosis

Figure 1. Folliculitis

Figure 2. CT Neck Showing Pt’s Left Facial Edema

Table 1. Differences between CA-MRSA and HA-MRSA

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>CA-MRSA</th>
<th>HA-MRSA</th>
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<tbody>
<tr>
<td>Mean age (years)</td>
<td>39</td>
<td>54</td>
</tr>
<tr>
<td>Mean length of hospital stay (days)</td>
<td>2.8</td>
<td>21.4</td>
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<tr>
<td>Health care exposure</td>
<td>Less frequent</td>
<td>More frequent</td>
</tr>
<tr>
<td>Susceptibility to clindamycin and TMP-SMX</td>
<td>Usually susceptible</td>
<td>Frequently resistant</td>
</tr>
<tr>
<td>Toxin-producing</td>
<td>More</td>
<td>Fewer</td>
</tr>
<tr>
<td>PVL-producing</td>
<td>Common</td>
<td>Rare</td>
</tr>
</tbody>
</table>

1Data based on results from References 3 and 4

REFERENCES

2. Adapted from Figure 2 of Boyle-Vavra S, Saum RS. 2007. Community-acquired methicillin-resistant Staphylococcus aureus; the role of Panton-Valentine leukocidin. Laboratory Investigation 87:4