DUKE ANTIMICROBIAL STEWARDSHIP OUTREACH NETWORK (DASON)

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A field guide: covering MRSA when treating SSTI and pneumonia

Our analysis of data collected in DASON member hospitals shows practice variation in empirically treating some patients for Methicillin-resistant *Staphylococcus aureus* (MRSA). Upon detailed review, several patients do not require empiric MRSA coverage based on presenting signs and symptoms. Over-treatment of MRSA typically occurs when 1) therapy is inappropriately begun, and/or 2) appropriate empiric therapy is subsequently not de-escalated. Such over-treatment increases the risk of emergence of VISA, VRSA, and VRE.

The focus of this month's DASON newsletter will be: 1) to review general considerations for initiating MRSA therapy 2) to identify specific scenarios to either chose alternate therapies or to de-escalate anti-MRSA therapy in patients with skin and soft tissue infections (SSTI) or pneumonia.

General Considerations:

Recognized risk factors for infection with MRSA include (1):

1. Hospitalization in the past 90 days
2. Residence in a long term care facility (LTCF) in the past year
3. Receipt of antibiotics or chemotherapy in the past 30 days
4. Currently requiring hemodialysis for end stage renal disease
5. In the hospital more than 2 days at the time of infection

Generally, patients who are presumed to be infected who present with one of the preceding risk factors **may** warrant the empiric use anti-MRSA therapy after, of course, appropriate cultures have been obtained. Importantly, *vancomycin may not be an appropriate for every patient with a possible Staphylococcal infection who reports a history of penicillin allergy*. Vancomycin, however, is an appropriate choice if there is a prior history anaphylaxis or a type I hypersensitivity reaction to penicillins. However, patients who lack a history of anaphylaxis/type I hypersensitivity reactions to penicillin can usually safely receive a cephalosporin.

Anti-MRSA agents and treatment of SSTI:

Purulent skin and soft tissue infections (SSTIs), which are defined as the presence of exudate, abscess, furuncles, or carbuncles, are often secondary to MRSA. Most cases of superficial SSTI (such as cellulitis) are NOT purulent (2, 3). *Streptococcus pyogenes* is the most common cause of non-purulent cellulitis.

(4). Providers treating non-purulent SSTIs in patients who lack a history of type I allergy to penicillin should choose an antibiotic with good *Streptococcal* coverage, such as a beta-lactam (2).

The following general guidelines for initiating the use of anti-MRSA agents in patients with SSTI are useful, but they are not meant to supplant clinical judgment, especially in complicated patients with multiple co-morbidities:

Give Anti-MRSA agent for patients with:

- Pus/purulent infection and/or signs of deeper infection (bullae, skin sloughing), severe sepsis, or concern for necrotizing fasciitis are present.
- Non-purulent cellulitis PLUS one of the following: severe infection (ICU care required or hypotensive), neutropenia, or immunocompromised state.

Avoid Anti-MRSA agent for patients with:

- Non-purulent cellulitis (no abscess)

De-escalation therapy of anti-MRSA agents *in patients with SSTI who have received empiric therapy:* We recommend discontinuing anti-MRSA therapy if cultures remain negative for MRSA after 48-72 hours. Exceptions to this scenario are: 1) patients with signs of deeper skin infections (bullae, skin sloughing), 2) patients with ongoing sepsis physiology, 3) patients with potential necrotizing fasciitis, 4) immunocompromised patients, and 5) patients with worsening or no clinical improvement.

Anti-MRSA agent use in pneumonia:

Practitioners must accurately distinguish between community acquired pneumonia (CAP) and healthcare-associated pneumonia (HCAP), as appropriate therapy depends on accurate diagnosis. *Streptococcus pneumoniae* is still the leading identifiable cause of CAP in the United States (1,5). Certainly, CAP secondary to MRSA exists, but it is quite rare, and therefore empiric coverage of MRSA for a patient with CAP is not routinely needed or recommended.

Patients meet the definition for HCAP if they 1) had a hospitalization in the past 90 days, 2) resided in a long term care facility (LTCF) in the past year, 3) received antibiotics or chemotherapy in the past 30 days, 4) require hemodialysis for end stage renal disease, or 5) are in the hospital more than 2 days at the time of infection onset. In general, practitioners should give anti-MRSA agents empirically to patients with HCAP awaiting results of cultures (1).

The following is a general guide for initiating anti-MRSA therapy in patients with **CAP**. As in patients with SSTI, these guidelines are not meant to supplant clinical judgement in complicated patients.

Give an anti-MRSA agent to patients who have:

- Radiographic evidence of **severe/cavitary pneumonia on radiographs**
- Risk factor(s) for healthcare-associated infection, even if they present from the community

Do not give an anti-MRSA agent to patients who have:

- CAP, even if severe, unless accompanied by radiographic evidence of cavitary lesions
- No risk factors for HCAP
- Suspected aspiration pneumonia, unless criteria for HCAP are also present.

The clinical management plan for patients with pneumonia who receive empirical therapy with anti-MRSA agents should include a strategy or plan to discontinue (de-escalate) the use anti-MRSA agents as soon as possible. The following general principles are useful in devising such a strategy: 1) both positive AND NEGATIVE cultures can be a basis for action, 2) the use of anti-MRSA coverage should be reassessed on a daily basis, and 3) the use of written stop dates at the beginning of the initiation of a course of antibiotics is often a good idea.

Anti-MRSA therapy can often be discontinued in patients with pneumonia if:

- A good quality respiratory culture does not reveal MRSA, **even if the patient is in the ICU when it returns**.
- Sputum cultures reveal MRSA and anti-MRSA therapy has been given for 7 days if cavitary lung lesions and concurrent MRSA bacteremia are absent.

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