Vancomycin, a glycopeptide antibiotic, remains the mainstay of treatment for methicillin-resistant Staphylococcus aureus (MRSA) infections. While daptomycin is a proven alternative for treating MRSA bacteremia, its effectiveness in osteoarticular infections (OAI) is not well-established. This study compares drug toxicity and clinical outcomes in patients (pts) receiving either daptomycin or vancomycin for MRSA OAI.

**Methods:** 1:2 case-control study conducted at Barnes-Jewish Hospital from 2005-2010 with a diagnosis of MRSA OAI identified through electronic medical records and confirmed by microbiology. Only pts with surgical and neurological management and clinical outcomes (e.g., drug toxicity, cure) in pts treated with daptomycin vs. vancomycin were identified and matched to 40 pts treated with vancomycin during the same period. Median age was 52 years. Most pts had osteomyelitis (82%). Most pts treated with daptomycin were initially started on vancomycin. Median treatment duration was 48 days for daptomycin vs. 46 days for vancomycin (p=0.5). Clinical success was achieved in 70% (42/60) of patients treated with vancomycin (p=0.5). Clinical success was achieved in 70% (42/60) of patients treated with vancomycin (p=0.5).

**Successful treatment was defined as:**
- Resolution of signs and symptoms of infection, and improvement in function, and improvement in inflammatory markers and imaging studies (when available), and no repeat surgery or re-admission for treatment of the same osteoarticular infection.
- Evidence of successful treatment was determined at three time points: initial clinic follow-up, and at 3 and 6 months after completion of treatment.

**Statistical analysis was performed using SPSS (SPSS Inc., Chicago, IL).** This study was approved by the Washington University Human Research Protection Office.

**RESULTS**

- **The mean age was 52 years.** Patients (pts) were treated with daptomycin or vancomycin were matched to daptomycin cases by year of treatment. Adjusting for pts lost to follow-up, clinical success and drug tolerability in this small case-control study of patients with MRSA OAI: Daptomycin is a reasonable alternative to vancomycin for treating MRSA bone and joint infections.

**METHODS II**

<table>
<thead>
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<tbody>
<tr>
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**Definitions**

- **Failure** (%): Failure of antibiotic therapy as determined at three time points: initial clinic follow-up, and at 3 and 6 months after completion of treatment. Clinical success was achieved in 70% (42/60) of patients treated with vancomycin (p=0.5). Clinical success was achieved in 70% (42/60) of patients treated with vancomycin (p=0.5).

**RESULTS**

- **The mean age was 52 years.** Patients (pts) were predominantly male (67%) and white (67%). 20 pts (cases) received daptomycin and 40 pts (controls) vancomycin.
- 49 pts (82%) had osteomyelitis, 11 pts (18%) had septic arthritis, and 10 pts (17%) had a combination of both.
- 34 (57%) infections were hardware-associated.
- 24 (40%) were diabetic, 8 pts (13%) had renal insufficiency, and 7 pts (12%) had peripheral vascular disease.
- Most pts treated with daptomycin initially started on vancomycin (18/20 (90%)).
- Median treatment duration of was 48 days for daptomycin (range 3-112) vs. 46 days for vancomycin (range 21-135) (p=0.5).
- Clinical success rates were similar between daptomycin and vancomycin at 3 months (15/18 (83%); p=0.8) and at 6 months (14/16 (87%) vs. 23/29 (78%); p=0.7), accounting for loss-to-follow-up.
- The frequency of adverse events did not differ between treatment groups (1% vs. 7% (18%); p=0.2).

**METHODS I**

1:2 case-control study conducted at Barnes-Jewish Hospital, a 1250-bed tertiary care hospital in St. Louis, Missouri. Patients (pts) treated with either IV daptomycin or vancomycin were identified through an existing outpatient parenteral antibiotic database. Controls treated with vancomycin were matched to daptomycin cases by year of treatment.

- **Inclusion criteria:**
  - Age ≥18 years.
  - Hospital admission between January 1, 2005 and December 31, 2010, and diagnosis of MRSA osteomyelitis and/or septic arthritis with a culture from bone, deep tissue and/or joint fluid.
  - Exclusion criteria:
    - 1: polymicrobial infection.
    - 2: persistent bacteremia (>2 hours).
    - 3: concurrent endocarditis.
  - Patients treated with vancomycin were matched to daptomycin cases by year of treatment.

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<th>Table 2: Additional characteristics of 20 patients treated with daptomycin</th>
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<td>Daptomycin</td>
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**Pre-treatment w/ vancomycin**

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**INTRODUCTION**

- **Staphylococcus aureus (S. aureus) is a frequent organism isolated in osteoarticular infections (OAI) [1].**
- **Vancomycin, a glycopeptide antibiotic, remains the mainstay of therapy against methicillin-resistant S. aureus (MRSA).**
- **Daptomycin, a cyclic lipopeptide, is bactericidal and active against otherwise drug-resistant Gram-positive bacteria.** Since its initial FDA approval in 2003 for skin and soft tissue infections, bloodstream infection, and right-sided endocarditis, daptomycin has been increasingly used in the management of OAIas [2].
- Few clinical comparisons of daptomycin vs. vancomycin-based treatment for MRSA OAI are available [3,4].

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