An Observational Study using Daptomycin to treat Osteomyelitis. A Pilot Study.
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Citation

Abstract

INTRODUCTION

Daptomycin is a novel new antibiotic that has been approved for the use of skin and soft tissue infections, right sided endocarditis, and gram positive bacteremia (1,2,3). There has been some data published on the use of this drug in prosthetic joint infections and on bone infections like osteomyelitis (4,5,6), but there has been no prospective published data on the treatment of osteomyelitis as yet.

MATERIAL AND METHODS

We summarize our observational data over a 2 year period wherein daptomycin was used as a primary drug in the treatment of osteomyelitis in a variety of sites. There were 36 patients in the study. The sites of osteomyelitis included knee (3), femur (2), foot (13), sternum (9), vertebral (3), skull (1), ankle/joint (1), elbow (1). Cure was defined as no evidence of active infection after treatment as evidenced by imaging studies and lab studies and follow up in 6 months and 12 months.

The diagnosis was based on the clinical presentation and or bone/deep cultures. The pathogens isolated included 28 patients with gram positive infections, MRSA (21), MSSA (5), polymicrobial infections (MRSA and gram negative organisms) (2), and enterococcus (1)) and culture negative (8).Twenty two of the 32 patients (61%) had been treated with previous antibiotics for standard periods of time and had failed therapy.

Previous drugs included vancomycin (9), quinolones (6), trimethoprim-sulphamethaxazole (2), nafcillan (1), cephalexin (1), aminogylcosides (1), carbapenem (1), and linezolid (1).

No obvious risk factors were noted in the patients who failed antibiotic therapy.

MIC’s were < 0.5ug/ml in 12 patients in whom MIC’s were obtained. Eighteen patients had no surgical debridement with the remaining undergoing debridement (92%) had removal of hardware (11%) if needed. Mean duration of treatment with daptomycin was 37 days, with a range between 17 and 42 days. Dosage of
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daptomycin used was 4-6 mg/kg/24h. All these patients were followed for an average of 6 months to 12 months.

Two patients (6%) expired of non-drug related causes; four patients (11%) failed daptomycin therapy and had to be retreated with daptomycin with clinical success.

MRSA patients comprised 21 (58%) of the study; which despite being treated with daptomycin only 5% failed. Two patients were lost to follow up, and 28 patients (78%) were presumed cured/improved. Among the 22 patients (61%) who received antibiotics prior to the study, nine patients (25%) were treated with vancomycin, of which two of these patients failed daptomycin the first time. No patients were terminated in this study due to side effects of the drug. The overall failure rate of this study was 11% (4 patients).

DISCUSSION

The cure/improvement rate (78%) seen in this study is encouraging and seems to be in keeping with other studies published (3) but will need to be substantiated in larger multicentered prospective studies. This study also adds to the data available regarding the safety of the drug. It appears that the 4 to 6 weeks of therapy at dosages ranging between 4-6 mg/kg are safe and well tolerated. Repeat use of the drug was also well tolerated. In addition, use of a higher dose (>6 mg/kg) may be necessary to see higher rates of clinical success as suggested by other studies (3,5,6). Further study is needed to study patients who fail therapy with daptomycin in osteomyelitis. Failure in this group of patients may be due to a variety of reasons such as the site of infection, organism causing the infections (MRSA), presence of hardware, underlying host factors, and other factors that have not been well delineated (7-10). This data is additive to the data published previously and suggest that daptomycin is a useful drug to treat osteomyelitis but additional study is warranted to define whether surgical intervention in addition to daptomycin plays a role in the outcome.

References

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