Treatment of a recurring infection of a pacemaker-pocket caused by methicillin-resistant staphylococcus aureus with tigecycline.

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Citation

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Abstract

Staphylococcus aureus is one of the most common causes of nosocomial infections, but also increasing in prevalence among community-acquired infections. Resistance to methicillin among staphylococcal strains represents a growing threat in the hospital setting, particularly in surgical and intensive care patients. Tigecyclin is the first glycylcycline antibiotic available for clinical use. We report about a multi-morbid patient with recurring pacemaker-pocket infection due to MRSA, which was treated with intravenous tigecycline.

INTRODUCTION

Staphylococcus aureus is one of the most common causes of nosocomial infections, but also increasing in prevalence among community-acquired infections [1, 2]. Resistance to methicillin among staphylococcal strains represents a growing threat in the hospital setting, particularly in surgical and intensive care patients [3, 4]. Tigecyclin is the first glycylcycline antibiotic available for clinical use. It is approved for complicated skin, skin-structure and complicated intra-abdominal infection treatment [5]. It is active against a wide range of multi-drug resistant Gram-positive and Gram-negative bacteria, including methicillin-resistant Staphylococcus aureus (MRSA). We report about a multi-morbid patient with recurring pacemaker-pocket infection due to MRSA, which was treated with intravenous tigecycline.

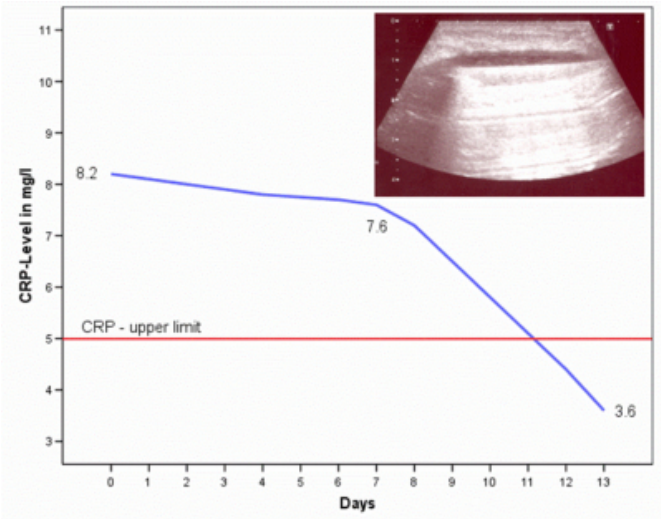
CASE REPORT

The patient was a 70 year old caucasian female with chronically hemodialysis due to terminal renal failure since 2002. Her medical history included insulin dependent diabetes mellitus, polyneuropathy and metabolic syndrome. In 2004 a pacemaker was implanted due to sinuatrial block. Furthermore she developed bradyarrhythmia absoluta in 2006. Therefore and for deep vein thrombosis of her right leg in 2006 she was orally anticoagulated. At admission in February 2008 she presented with infection of the pacemaker pocket. No fever, no leucocytosis and only a discrete elevation of C-reactive protein (CRP) were found. Sonographically no abscess but a diffusely infiltrated tissue around the pacemaker-cables was seen. Transesophageal echocardiography showed no signs of intracardiac involvement and calculated intravenous antibiotic therapy with 1g ceftriaxon daily was initiated. During treatment for 14 days restitution of the local clinical findings occurred and the CRP-level normalized. Computed tomography showed no signs of infection in the pacemaker pocket and no involvement of the intracardial pacemaker-cables. Twelve days after the treatment the local signs of infection reoccurred and sonographically an abscess impressed. The CRP-level rose again, but there was no fever, leukocytosis or elevation of procalcitonin-level. Intracardiac involvement was again echocardio¬graphycally excluded. Again calculated antibiotic therapy, this time with twice a day application of 500 mg ciprofloxacin orally was initiated. After 12 days of treatment the local clinical findings still indicated infection. Also sonographically signs of infection could still be seen around the pacemaker and now also around the cables. Echo¬cardiographically no involvement of the intracardial pacemaker-cables could still be seen. A puncture of the abscess was performed and the microbiological analysis showed MRSA. The organism was multi¬resistant to ampicillin, oxacillin, imipenem, ciprofloxacin and moxifloxacin, as well as intermediate to tetracycline. However it was susceptible to tigecycline, which was applied intravenously for 10 days. The initial

dose of 100 mg was followed by 50 mg every 12 h. At this time the CRP-level fell (Figure 1) and local clinical findings normalized. Twelve days after the treatment no infectionsigns could sonographically (Figure 1) be found and the patient was discharged.

Figure 1

Figure 1. CRP-trend from 1 days before till 3 days after treatment with tigecycline and sonographical picture of the pacemaker-pocket without signs of infection after antibiotic treatment



DISCUSSION

Infections of pacemaker-aggregate and/or cables are severe problems due to the existing pathway to the cardiac cavities and the risk of endocarditis [6]. Due to a high mortality (between 31-66%) if the intracardiac pacemaker-cables are involved removal of the infected system is indispensable [7]. Removing the pacemaker-system is often a problem caused by the pacemaker dependency. Implanting a new system while the inflammatory process is still present, the risk for recurrent infection increases. Therefore when the intracardiac pacemaker-cables are not involved antibiotic treatment is a suitable therapy, especially when multi-resistant pathogens like MRSA are involved. Tigecycline, the first clinically available glycylcycline, is a minocycline-derived antibiotic that remains active in the presence of the ribosomal modifications and efflux pumps that mediate tetracycline resistance [8]. Thus, it possesses broad-spectrum bacteriostatic activity, including activity against MRSA [9].

Following twice a day intravenous administration, it is extensively distributed to various body tissues and fluids and takes also effect in abscessing infections like in this case. Dose modification is only required in patients with significant hepatic impairment, which was not needed in this case. No dosage adjustment is required in patients with renal impairment or receiving haemodialysis [10] like in this case. Because of the metabolic profile of tigecycline, the potential for drug interactions appears to be minimal which is of great importance in multi-morbid patients.

In conclusion it appears that tigecycline is an efficacious treatment of complicated skin and skin structure infections due to MRSA. Especially in patients with terminal renal failure and high co-morbidity it is an advisable application.

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