Daptomycin for cardiac infections: documented cardiac implantable electronic devices (CIED) /cardiac circulatory devices (CCD) infections and operated infective endocarditis (IE). A 43-case series eP411

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Introduction

Cardiac infections present with high mortality rates and are currently presenting a shift in epidemiology[1,5]. *Staphylococcus aureus* is the main pathogen involved in infective endocarditis[1], and new entities, such as Cardiac Implantable Electronic Devices (CIED) or Cardiac Circulatory Devices (CCD) infections, are rising or emerging[5,6].

Recent data suggest that early cardiac surgery could reduce embolic events and mortality in IE[2]. Effective antibiotic treatment is also a keypoint in valvular surgery for IE[3].Daptomycin possesses extensive coverage of GRAM positive cocci, which represent most cases of IE. It has in vitro activity against biofilm embedded pathogens[4], but has been scarsely studied in the clinical setting of biofilm related infections until recently[6,7].

The aim of the study was to report documented cases of cardiac infections with material involvement, treated with daptomycin.

Materials and Methods

Retrospective observational study realized in two centers (CHRU Lille and CH Lens, France) where are performed cardiac surgery, and with CIED implantation and retrieval activity.

Duration of inclusion: 3 years.

Inclusion criteria: operated infective endocarditis, CIED or CCD infections treated with daptomycin either as an empiric or documented treatment.

Study of patients' baseline characteristics, microbiology (pathogens and methicillin resistance), daptomycin posology, associated antibiotics, and outcome.

References

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Results

Patients' data for IE cases (20): 85% male, median age 58; 60% of comorbidities (respiratory, renal or hepatic chronic diseases, or diabetes mellitus). For CIED/CCD infections patients (23), 65% were male, median age was 68 years, 39% of comorbidities. 61% of CIED infections were related to pace-makers, 30% to defibrillators, 8,6% to circulatory assistance devices (heart mate). Pathogens for IE were mainly MSSA (35%), Coagulase Negative *Staphylococci* - CoNS- (35%), MRSA (15%), Streptococci (20%), and Enterococci (15%). Total exceeds 100% because of existence of polymicrobial infections. (figure 1).

For CIED/CCD infections, microbiological sampling shew CoNS (65%), including meticillin resistant (MR) species (73% of CoNS), MRSA, *Corynebacterium* (8,6%each) MSSA (4,3%), Enterococcus faecalis (4,3%), and GRAM negative bacilli (4,3%); with presence of polymicrobial infections. (Fig 2).

Fig1: pathogens (%) in operated IE:

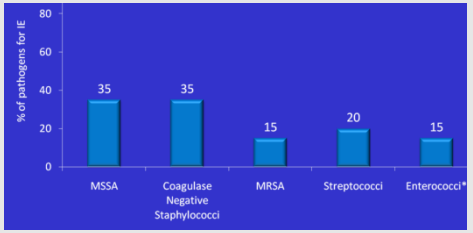
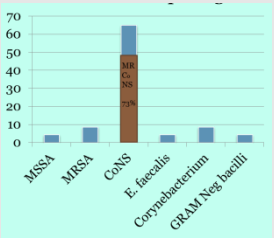


Fig2: pathogens (%) in CIED/CCD infections:



Daptomycin for operated IE was used as empiric therapy in 14 cases and as curative treatment in 9(%), or both. For CIED/CCD infections, empiric therapy with secondary desescalation was done in all cases but one (95%). **Median posology was 8mg/kg. associated antibiotics were mainly piperacillin-tazobactam in empiric regimens and rifampin in documented treatments.**

All cause mortality for patients with operated IE was 25% at 6 months. **No patient presented relapse of infection on implanted prosthetic valves**. For patients with CIED/CCD infections, failure was observed in four cases (17%), including 3 relapsing infections. Mortality was 13%, including one patient with cardiac circulatory assistance.

Conclusions

Impairment of biofilm formation and rapid bacterial killing by daptomycin, as described in experimental studies on foreign body infections[4],could have a special impact in cardiac surgery. It is suggested they could « protect » material from infection by GRAM positive cocci. Through lowering the rate of relapsing infections on implanted valves, it could secure early surgery when necessary.

Nevertheless, more clinical studies are necessary to confirm this hypothesis.

In CIED/CCD infections where methicillin resistant pathogens are frequent, daptomycin could be beneficial for patients as an empiric or documented treatment[6].

Previous data have shown efficacy of daptomycin in this setting[6], that could be explained through frequent high Vancomycin MIC of Coagulase Negative *Staphylococci*.

The use of daptomycin in cardiac infections with material involvement seems promising but needs to be better defined.

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