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Infections associated with implantable cardiac electronic devices: microbiology study and analysis of management practices

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Background: The rate of patients with implantable cardiac electronic devices (ICEDs) is increasing. Infection is a major complication of the use of these devices, with rates ranging from 0.5 to 2.2%.

Management of such infections is heterogeneous among care centers in a same country and probably among European countries. The aim of our study was to determine microbiological epidemiology of ICED infections and to evaluate the practices in one French regional reference center for ICED management.

Material/methods: We conducted a retrospective observational monocentric study including 100 consecutive patients admitted for ICED infection in a large private cardiologic center during a five-year period (June 2011-June 2016). The list of patients was obtained using data from the Department of Medical Informatics

Results: The mean age of patients was 77 years (39-95), 77% were male. Infections involved pacemakers in 83% of cases and defibrillators in 17%. All infections were considered as “deep” infections, involving intravenous portion of the leads. Endocarditis was diagnosed in 28% of cases. The complete device removal was carried out in all cases. Blood cultures were performed in only 52 patients and were positive for 28. Among 160 cultures obtained from distal portion of the leads, 123 were positive. Concordance between cultures of the leads and those of pus aspirated from the pocket site was high (about 80%). Coagulase negative staphylococci (CNS) were isolated from

cultures in 63 patients, *S. aureus* in 25, Gram negative bacilli (GNB) in 15 and streptococci in 9. About 40% of CNS and 20% of *S. aureus* were resistant to methicillin. Only one strain of GNB was resistant to third generation cephalosporins. Empirical treatment for ICED infection (waiting for the results of cultures) was prescribed to 96 patients. For 61 patients it was a monotherapy and for 35 a combination of 2 antibiotics. Most prescribed antibiotics were anti staphylococcal penicillins (oxa or cloxacillin, in 57.3% of treated patients). Glycopeptides were used only in 15% of treated patients. About 10% of patients received a quinolone. According to subsequent cultures results, empirical treatment was effective in only 59.4% of cases. The median duration of treatment was 30 days, with no significant difference between endocarditis and other ICED infections (31 vs 28 days).

Conclusions: This study highlights different ways for improving the management of patients with ICED infection. The results will lead us to make proposals for empirical antibiotic therapy adapted to the microbial epidemiology of our center and probably to those of other centers in France. Finally, it would be interesting to conduct a study on the practices of management of ICED infections in various European countries.