P1396 | BEDSIDE

Indications and outcomes of implantable cardioverter defibrillator implantation in patients with long-QT syndrome

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Background: Long-QT syndrome (LQTS) is associated with an increased risk of sudden cardiac death or syncope caused by ventricular tachyarrhythmia. Thus, implantable cardioverter defibrillators (ICD) become the main therapeutic option for patients with LQTS. We aimed to investigate the clinical outcome of ICD implantation in this collective.

Methods: In our institution, 53 of overall 4987 patients (1%) presented different types of LQTS. In this collective (32 female patients (60%); age at diagnosis 40.6±19.3 years), 42 patients (79%) were treated with an ICD because of high risk for sudden cardiac death (sudden death survivor, syncope, family history of sudden cardiac death). The term “ICD therapies” summarized anti-tachycardia pacing and shocks.

Results: Mean ICD follow-up period was 5.8±4.5 years. Appropriate ICD therapies were documented in 19 patients (45%), independently of the genetic type of LQTS. Inappropriate shocks were found in 14 patients (33%); five patients (12%) revealed only inappropriate therapies without the need of appropriate therapies. Causes of inappropriate ICD therapies were atrial fibrillation (50%), lead dysfunction (23%), electro-mechanical artifacts (14%), and T wave oversensing (7%). In the overall LQTS collective, atrial fibrillation was found in 12 patients (22%); 7 of these patients revealed paroxysmal atrial fibrillation.

Conclusions: Patients with LQTS do benefit from ICD implantation. The problem of inappropriate ICD therapies is still of major concern, with atrial fibrillation being the major cause. Despite the young average age, patients with LOTS revealed a relatively high prevalence of atrial fibrillation.

P1399 | BEDSIDE

Defibrillation threshold testing at the time of implantable cardioverter defibrillator implantation does not predict clinical outcomes during long-term follow up: a meta-analysis

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Purpose: Intraoperative defibrillation threshold testing (DFT) has been an integral part of implantable cardioverter defibrillator (ICD) implantation and has been used in all major ICD trials. However, there are still many uncertainty about its benefit on clinical outcomes.

Methods: We performed a comprehensive search in PubMed, Cochrane Library, MEDLINE, EMBASE, and abstracts presented at national meetings. Two reviewers abstracted all the information and a tie breaker resolved discrepancies. We used Review Manager (RevMan) (Computer program) Version 5.0, for analysis. The risk ratio (RR) with 95% confidence intervals (CI) were calculated using random effect model.

Results: We reviewed a total of 752 abstracts of which 10 studies were selected for full review. We abstracted for analysis 8 studies involving 5,020 patients (DFT, n=3,068; no DFT, n=1,952) with median follow up of 24 months. One study was randomized control trial, one was prospective, and six were retrospective studies. Heterogeneity among the studies was high, and the response to precluded a pooled analysis of mortality and ventricular arrhythmias; however, there was no mortality benefit of performing DFT at the time of ICD implantation (RR=0.94, 95% CI 0.74-1.21; I2=47%) as well as occurrence of ventricular arrhythmias (RR=1.18, 95% CI 0.85-1.68; I2=68).

Results: ICD was implanted for primary prevention in 64% (77/121) of patients. During follow-up of 95 (IQR 60–110) months, nsVT occurred in 84% (n=102) and sustained VA in 37% (n=45, SMVT in 41, SPVT in 8, VF in 7). ATP was delivered in 38/41 patients with SMVT (336±37 msec). ATP was always effective in 25/38 and ATP was ineffective in 13/38 patients. Survival from first time of effective/ineffective ATP is illustrated in Figure 1. Ineffective ATP in SMVT patients was associated with increased all-cause and cardiac mortality (hazard ratio 3.2 (95% CI 1.2–8.5), p=0.022 and 7.3 (95% CI 2.1–25.6), p=0.002).

Conclusions: Ineffective ATP for SMVT in NICM patients was strongly associated with increased all-cause and cardiac mortality, which may indicate a different underlying substrate and/or VT mechanism.
Conclusion: This is the first meta-analysis that consolidates the available information comparing DFT to deferred DFT at the time of ICD implantation. DFT at the time of ICD implantation does not predict clinical outcomes during long term follow up. Further large multicenter randomized controlled studies, adequately powered to detect clinical outcomes are required.

Background:
CIED infection is associated with significant morbidity and mortality.

Methods:
We analyzed 2891 consecutive pts who underwent a CIED procedure (subcategorized as pacemaker (PPM), implantable cardio-defibrillator (ICD), cardiac resynchronization therapy – PPM (CRT-P), and CRT-defibrillator (CRT-D)) between 1/07-9/11. All patients were followed for 6 months. We identified all pts who suffered a major infection (removal of all hardware) within 6-months of the procedure.

Results:
The study cohort had a mean age of 77±12 years and included 1764 (68%) males. The devices were distributed as: 1740 (60%) PPMs, 677 (23%) ICDs, 426 (15%) CRT-Ds, and 48 (2%) CRT-Ps. Only 44 (1.5%) of 2891 pts suffered an infection. These pts were more likely to be male (p=0.001), have diabetes (p=0.028), EF < 40% (p=0.003), CHF (p<0.0001), and have had a CRT-D procedure (p<0.0001). In fact, CRT-D procedures were associated with a 6-month infection rate of 4.23% (Figure, p<0.001).

Conclusions: Hospitals assess their CIED infection rate by using the total volume of CIED implants as the denominator. This methodology skews the infection rate because PPMs, which are associated with a very low rate of infection, comprise a much higher volume than ICDs and CRT-D devices. It is critical to assess CIED infection rate as a function of device type: against this standard, CRT-D devices are associated with an unacceptably high infection rate resulting in substantial utilization of unreimbursed health care resources.

P1404 | BEDSIDE
Transvenous placement of the subcutaneous coil electrode to reduce elevated defibrillation thresholds: an alternative to an azygous or subcutaneous coil

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Purpose: Despite waveform optimization, high output devices, dual coil elec-