Implantable Cardioverter Defibrillator Interrogations in the Hospital Emergency Department, Analysis from the CHECK-ED study

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**Introduction**: Patients with an implantable cardioverter defibrillator (ICD) who present to emergency departments (ED) often require device interrogation. The frequency of ICD checks in the ED compared to other cardiac implantable electronic devices (CIED) such as permanent pacemakers (PPM) is not known and the yield of clinically relevant information from these interrogations has not been established.

**Methods**: A retrospective study of all CIED interrogations in our ED over a 12-month period, up until 4th Sep 2017, was performed. A Remarkable Issue (RI) was defined as: an arrhythmia related to the ED presentation; delivery of tachyarrhythmia therapy since last device check; or an issue resulting in a necessary programming change or requiring lead/device revision. The RIs were therefore classified as atrial arrhythmia, ventricular arrhythmia or system issues.

**Result**: A total of 354 CIED checks were performed in the ED during the study period. ICD checks accounted for 28% (n=100) of the interrogations and were performed on 77 different patients (male=63 (82%), mean age 66±18 years old). In total, half of all ICD checks had RI (n=50), with some checks meeting multiple RI criteria. Sustained arrhythmias were logged in 44 checks, with anti-tachycardia pacing in 12 checks and at least one shock logged for 21 checks, while immediate device reprogramming was performed for only 10 checks. Statistically significant differences in the proportion of checks with or without RI were seen for presenting symptoms of palpitations, ICD shock and syncope/presyncope (fig 1). Thirty-six patients (47%) had at least one presentation with a device check revealing RI. There were no significant differences in baseline characteristics between patients with or without RIs. However, patients with multiple presentations during the study period were more likely to have an RI compared to those without RI (n=11 (30.6%) & 5 (12.2%) respectively, p=0.048).

**Conclusion**: ICD interrogations constituted more than one quarter of CIED checks in the ED, and half of these ICD checks revealed clinically significant findings. Presenting symptom or recent history of repeat presentations to the ED did differ in the yield of significant issues.