Safety of omitting defibrillation efficacy testing with subcutaneous defibrillators: a propensity matched case-control study

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Background: Defibrillation efficacy testing (DT) is recommended at implantation of subcutaneous implantable cardioverter–defibrillators (S-ICD). However, prior works found that adherence to this recommendation is declining in clinical practice.

Purpose: To compare survival from all-cause death and first ineffective shock (primary endpoint) and the composite of all-cause death, ineffective shock, inappropriate shock and device-related complication (secondary endpoint) between patients who underwent DT and those with omitted DT.

Methods: We analyzed 1652 consecutive patients who underwent S-ICD implantation in 60 Italian centers from 2013 to 2019.

Results: DT was not performed in 325 (20%) patients (no-DT patients). As compared with the DT group, these patients were older (51 ± 16 vs. 48 ± 15 years; $p < 0.01$) and had lower ejection fraction (37 ± 16% vs. 46 ± 16%; $p < 0.01$). The 325 no-DT patients were propensity matched with 325 patients of the DT group. During a median follow up of 19 months, 27 (4.2%) patients died for any-cause. During follow-up, 34 (5.2%) patients received appropriate shocks to treat discrete episodes of VT/VF. The first shock was effective in 30 out of 34 patients (88%), whereas a second shock was required to terminate VT/VF in 3 patients and a third shock in the last one. The primary endpoint occurred in 31 (4.8%) patients, and the risk was not significantly increased in the no-DT cohort (HR = 1.26, 95%CI:0.62-2.55, $p = 0.522$). Inappropriate shocks were reported in 36 (5.5%) patients and device-related complications in 25 (3.8%) patients during follow-up. Survival from the composite secondary endpoint was comparable between groups (HR = 0.86, 95%CI:0.57-1.32, $p = 0.500$).

Conclusions: Our data confirmed that DT is frequently omitted in current clinical practice, especially in older patients with worse systolic function. A strategy that omits DT did not appear to compromise the effectiveness of the S-ICD and no additional risk seems associated with DT omission at a mid-term follow-up. These data suggest that routine DT at S-ICD implant might not be necessary. Randomized trials are needed to confirm this finding.