Remote heart failure management using a multiparameter implantable cardioverter-defibrillator alert: the multicentric RE-HEART registry

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On behalf of RE-HEART registry group

Funding Acknowledgement: Type of funding source: None

Background: The HeartLogic algorithm combines multiple implantable cardioverter-defibrillator (ICD)-based sensors into an index for prediction of impending heart failure (HF) decompensation. In patients with ICD and cardiac resynchronization therapy ICD remotely monitored at 13 Spanish centers, we analyzed the association between clinical events and HeartLogic alerts and we described the use of the algorithm for the remote management of HF.

Methods: The association between clinical events and HeartLogic alerts was studied in the blinded phase (from ICD implantation to alert activation – no clinical actions taken in response to alerts) and in the following active phase (after alert activation – clinicians automatically notified in case of alert).

Results: We enrolled a total of 215 patients (67±13 years old, 77% male, 53% with ischemic cardiomyopathy) with ICD (19%) or CRT-D (81%). The median duration of the blinded phase was 8 [3–12] months. In this phase, the HeartLogic index crossed the threshold value (set by default to 16) 34 times in 20 patients. HeartLogic alerts were associated with 6 HF hospitalizations and 5 unplanned in-office visits for HF. Five additional HeartLogic threshold crossings were not associated with overt HF events, but occurred at the time of changes in drug therapy or of other clinical events. The rate of unexplained alerts was 0.25 alert-patient/year. The median time spent in alert was longer in the case of HF hospitalizations than of in-office visits (75 [min-max: 30–155] days versus 39 [min-max: 5–105] days). The maximum HeartLogic index value was 38±15 in the case of hospitalizations and 24±7 in that of minor HF events. The median duration of the following active phase was 5 [2–10] months. After HeartLogic activation, 40 alerts were reported in 26 patients. Twenty-seven (68%) alerts were associated with multiple HF- or non-HF related conditions or changes in prescribed HF therapy. Multiple actions were triggered by these alerts: HF hospitalization (4), unscheduled in-office visits (8), diuretics increase (8), change in other cardiovascular drugs (5), device reprogramming (2), atrial fibrillation ablation (1), patient education on therapy adherence (2). The rate of unexplained alerts not followed by any clinical action was 0.13 alert-patient/year. These alerts were managed remotely (device data review and phone contact), except for one alert that generated an unscheduled in-office visit.

Conclusions: HeartLogic index was frequently associated with HF-related clinical events. The activation of the associated alert allowed to remotely detect relevant clinical conditions and to implement clinical actions. The rate of unexplained alerts was low, and the work required in order to exclude any impending decompensation did not constitute a significant burden for the centers.