

Prognostic Impact of Long-term Remote Monitoring in Heart Failure Patients with Implantable Devices

Preliminary Analysis

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BACKGROUND

Repeated hospitalizations in patients with chronic heart failure with low left ventricular ejection fraction (CHF) are a leading cause of hospital readmission (McMurray, *Eur Heart J*, 2012), with impact on mortality (Stewart S, *Eur J Heart Fail*, 2001). It represents a growing public health problem, namely as a determinant of health care expenditure. Remote monitoring in CHF patients with implantable devices has been a target of interest, as it may facilitate the identification of patients facing higher risk of acute decompensation (Whellan, *JACC* 2010), allowing tailored intervention and therefore avoiding hospital admission (Yu, *Circulation* 2005). It will ultimately affect CHF outcomes, economic burden of heart failure and quality of life, and is an area of great clinical interest and under active investigation (Bui, *JACC* 2012).

PURPOSE

To evaluate the first incoming results of the remote monitoring in CHF patients submitted to cardiac resynchronization therapy (CRT) devices implantation.

METHODS

Seventy-one patients with CRT devices (76% male, age 67 ± 10 years, ejection fraction of $25 \pm 6\%$ previous to CRT, 60% with non-ischemic cardiomyopathy, 28% with atrial fibrillation, 90% having a CRT combined with cardioverter-defibrillator) and more than 1-year follow-up. There were 74% of clinical responders (stable functional improvement ≥ 1

NYHA class). From the potential measurements for CHF monitoring, we considered automatic alarm checks of intrathoracic impedance and atrial or ventricular tachyarrhythmias detection, and retrospectively analysed acute decompensated heart failure episodes with hospital admission and overall mortality.

RESULTS

After a mean follow-up of 2.5 ± 0.97 years, there were eight (11.2%) hospital admissions and one fatal outcome due to heart failure. In 75% of the hospitalised patients, device alert occurred previously, with elevated threshold of intrathoracic impedance ($p < 0.01$; Fisher) and arrhythmia detection (both atrial and ventricular) ($p < 0.0001$; Fisher). These alarms were automatically activated on the remote monitoring system on a medium period of 36 days previous to the hospital admission and two days prior (ventricular arrhythmia detection) on the fatal case. In this population, echocardiographic parameters pre- or post-CRT implant and clinical response to the CRT were not independent predictors of hospital admissions.

CONCLUSIONS

Remote monitoring systems represent an advantage in the complex follow-up of CHF patients with CRT devices, and can play a fundamental role in future strategies of therapeutic optimization to reduce hospital admissions due to acute decompensated heart failure. Further testing will be needed to increase specificity and sensitivity of a remote follow-up

strategy to detect and prevent HF decompensations.

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