



ORIGINAL ARTICLE

A link to better care: The effect of remote monitoring on long-term adverse cardiac events in a propensity score-matched cohort



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KEYWORDS

Remote monitoring;
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Abstract

Aims: There are conflicting data regarding the clinical benefits of device-based remote monitoring (RM). We sought to assess the effect of device-based RM on long-term clinical outcomes in recipients of implantable cardioverter-defibrillators (ICDs).

Methods: We assessed the incidence of adverse cardiac events, overall mortality and device therapy efficacy and safety in a propensity score-matched cohort of patients under RM compared to patients under conventional follow-up. Data on hospitalizations, mortality and cause of death were systematically assessed using a nationwide healthcare platform. The primary outcome was time to a composite outcome of first hospital admission for heart failure or cardiovascular death.

Results: Of a total of 923 implantable device recipients, 164 matched patients were identified (84 under RM, 84 under conventional follow-up). The mean follow-up was 44 months (range 1-123). There were no significant differences regarding baseline characteristics in the matched cohorts. Patients under RM had a significantly lower incidence of the primary outcome (hazard ratio [HR] 0.42, confidence interval [CI] 0.20-0.88, $p=0.022$); there was a non-significant trend towards lower overall mortality (HR 0.53, CI 0.27-1.04, $p=0.066$). No significant differences between cohorts were found regarding appropriate therapies (RM vs. conventional follow-up, 8.1 vs. 8.2%, $p=NS$) or inappropriate therapies (6.8 vs. 5.0%, $p=NS$).

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PALAVRAS-CHAVE

Monitorização remota;
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Conclusion: In a propensity score-matched cohort of ICD recipients with long-term follow-up, RM was associated with a lower rate of a combined endpoint of hospital admission for heart failure or cardiovascular death.

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O efeito da monitorização remota em eventos cardíacos adversos numa amostra emparelhada por *propensity-score matching*

Resumo

Objetivos: Existem dados contraditórios acerca dos benefícios clínicos da monitorização remota (MR). Os autores procuraram aferir o efeito da MR de dispositivos cardíacos implantáveis em eventos clínicos a longo prazo.

Métodos: Os autores avaliaram a incidência de eventos cardíacos adversos, mortalidade global, e a eficácia e segurança das terapêuticas entregues pelo dispositivo numa amostra de pacientes portadores de cardioversor-desfibrilhador implantável (CDI) após emparelhamento por *propensity score*, comparando doentes sob MR com doentes em seguimento convencional. Dados relativos a hospitalizações, mortalidade e causa de morte foram sistematicamente avaliados com recurso à Plataforma de Dados de Saúde. A análise primária consistiu no tempo até um evento composto de internamento por insuficiência cardíaca (IC) ou morte cardiovascular.

Resultados: Num total de 923 portadores de dispositivos cardíacos, identificámos 164 pacientes emparelhados (84 sob MR, 84 sob seguimento convencional. O tempo médio de seguimento foi 44 meses (entre 1-123 meses). Não se observaram diferenças significativas nas características basais entre os dois grupos após emparelhamento por *propensity score*. Doentes sob MR tiveram uma incidência significativamente menor do evento composto de internamento por IC ou morte de causa cardiovascular (*hazard ratio* [HR] 0,42; intervalo de confiança [IC] 0,20-0,88; $p=0,022$); houve uma tendência não estatisticamente significativa para uma menor mortalidade global (HR 0,53; IC 0,27-1,04; $p=0,066$). Não se observaram diferenças entre grupos relativamente a terapêuticas apropriadas (MR *versus* seguimento convencional; 8,1 *versus* 8,2%, $p=NS$) ou terapêuticas inapropriadas (6,8 *versus* 5,0%, $p=NS$).

Conclusão: Numa amostra emparelhada por *propensity score* de portadores de CDI, a MR associou-se a uma menor incidência de um evento composto de internamento por IC ou morte cardiovascular a longo prazo.

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Introduction

Technological developments and expanded indications have resulted in a large population of recipients of implantable electronic cardiac devices, including a significant increase in the number of patients with implantable cardioverter-defibrillators (ICDs). This growing population represents a unique challenge regarding follow-up, requiring an experienced team with in-depth knowledge of device programming and potential complications.¹ To date, optimal clinical resource allocation is not established regarding appropriate follow-up for these patients.

In this context, remote monitoring (RM) is poised to be a valuable tool in the intensive and continuous follow-up of ICD patients. Published data support the safety and efficacy of this intervention.¹ However, data regarding potential clinical benefits are scarce, with short follow-up periods and mainly limited to specific ICD brands.

In this study we aimed to assess the long-term clinical benefits of RM in a population of ICD patients for primary

prevention of sudden cardiac death. To this end, we sought to investigate the effect of RM on hospital admissions for heart failure (HF) and cardiovascular death.

Methods**Study population**

We performed a propensity-matched retrospective cohort study of consecutive patients referred to a tertiary center for implantation of an ICD for primary prevention who underwent implantation between December 2002 and October 2014.

Implantable cardioverter-defibrillator implantation

Implantation of an ICD was performed according to international guidelines² for patients with systolic dysfunction or primary channelopathies. Implantation in the setting of hypertrophic cardiomyopathy was performed

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