The REM-HF trial: Remote monitoring of implantable cardiac devices: No added benefit

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For heart failure patients with cardiac implantable electronic devices (CIEDs), remote monitoring of their condition does not improve outcomes compared to usual care, according to Hot Line results presented at ESC Congress 2016 and to be simultaneously published in *JAMA*.

Findings from the Remote Management of Heart Failure Using Implantable Electronic Devices (REM-HF) trial showed that remote monitoring was not associated with reduced mortality or fewer cardiovascular hospitalisations compared to usual care.

"Results from this trial, in a setting intended to maximize the benefit of remote monitoring, do not support its routine use in the management of patients with CIEDs," commented Martin R. Cowie, MD, from Imperial College London, (Royal Brompton Hospital), London, UK, co-principal investigator of the study.

"The assumption that 'more data improves outcomes' is not true," he added. "If patients are well-treated already, and have well-controlled symptoms, looking at remotely collected data weekly is no better than usual care."

CIEDs that are equipped with remote monitoring capabilities store data that can be downloaded and transmitted via the internet or telephone

connections to their physicians for interpretation. Rather than travelling into the clinic for an appointment, patients can receive feedback and advice based on this data, which can alert doctors to signs of worsening heart failure or arrhythmia.

In the REM-HF study, conducted at 9 British hospitals, 1,650 heart failure patients (mean age 70 years) had one of 3 types of CIEDs equipped for remote monitoring:

- cardiac resynchronization therapy [CRT] device with pacemaker [CRT-P];
- CRT device with defibrillator function [CRT-D];
- or implantable cardioverter-defibrillator [ICD]);

The patients were randomized to receive either usual care (UC) or remote monitoring (RM).

RM patients had data downloaded automatically from their device on a weekly basis and this was transmitted to their healthcare professional who used it to advise them about medication and lifestyle, need for additional clinic visits, or recommendations to visit their general practitioner or the emergency room. They also had the usual care delivered by their local heart failure service.

In contrast, UC patients did not have weekly automatic downloads, but had usual remote monitoring of the device (typically 3-6 monthly) in addition to usual care from their heart failure service.

The primary endpoint of the study was the first event of death from any cause or unplanned hospitalisation for cardiovascular reasons. Secondary endpoints included death from any cause, death from cardiovascular reasons, and unplanned hospitalisation.

After a median follow-up period of 2.8 years, no significant difference was seen between the groups in the primary end point, which occurred in 42.4% of the RM group and 40.8% of the UC group (hazard ratio 1.01; 95% confidence interval [CI] 0.87 to 1.18; P=0.87).

Secondary endpoints also occurred at a similar rate in both groups.

"Although some studies investigating a range of remote monitoring strategies have suggested potential benefit, and adoption of remote monitoring is quite widespread, results of the REM-HF trial offer a new perspective that has the potential to change clinical practice", said John Morgan, MD, University of Southampton, co-principal investigator of the study.

"Our trial is distinct in its design, comprising multiple manufacturers' devices, with monitoring occurring in the patients' usual care centres, and with potentially pre-emptive care interventions driven by observation of trends seen over the course of routine weekly downloads of multiple diagnostic variables".

"Despite a large number of patients, considerable follow-up time, acceptable patient adherence to weekly downloads, and additional contacts with patients driven by the remotely collected data, we did not demonstrate any improvement in outcome for patients randomized to remote monitoring compared to usual care in nine English hospitals," added Dr. Cowie.

"It is possible that an effect could be demonstrated in health care systems with less well developed usual care, where patients are less-well treated and have more severe symptoms".

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