Brief Report

Implementation of Real-Time Assessment of Patient-Reported Outcomes in a Heart Failure Clinic: A Feasibility Study

JOSEF STEHLIK, MD, MPH,[1] CARLOS RODRIGUEZ-CORREA, MD,[1] JOHN A. SPERTUS, MD, MPH,[2] JOSHUA BIBER, MS, MBA,[1] JOSE NATIVI-NICOLAU, MD,[1] SUSAN ZICKMUND, PhD,[1] BENJAMIN A. STEINBERG, MD, MHS,[1] DAVID C. PERITZ, MD,[1] ANDREW WALKER, MD,[1] JORDAN HESS, MD,[1] STAVROS G. DRAKOS, MD, PhD,[1] ABDALLAH G. KFOURY, MD,[1,3] JAMES C. FANG, MD,[1] CRAIG H. SELZMAN, MD,[1] AND RACHEL HESS, MD, MS[1]

Salt Lake City, Utah; and Kansas City, Missouri

ABSTRACT

Background: Patient-reported outcomes (PROs) quantify, from patients' perspectives, their symptoms, function, and quality of life. Our aim was to determine the feasibility of integrating PRO capture into routine clinical practice at a large heart failure (HF) clinic.

Methods: We examined the practicality of PRO completion at the time of clinic visit, the time required to complete the selected instruments, the completion rate, and the feasibility of immediate PRO scoring and integration of the results into the electronic health record (EHR). We deployed a computer program to capture PROs (Kansas City Cardiomyopathy Questionnaire, Patient-Reported Outcomes Measurement Information System) on a portable computer platform at the time of a clinic visit. An automated algorithm identified patients scheduled for appointments at the HF clinic at registration, provided a portable tablet computer with which to complete the appropriate PRO instruments and then scored and immediately integrated the results in the patient's EHR.

Results: In a 12-month period, 862 unique patients completed 1,320 PRO assessments. The mean age of this cohort was 60.1 ± 16.3 years and 66% were male. The average time for PRO assessment was 6.7 minutes and the completion rate among eligible patients was 58%, with 91% of started assessments completed in full.

Conclusions: These preliminary data support the feasibility of serial PRO assessment with real-time integration into the EHR in a large outpatient population of patients with HF. We identified critical steps that should enhance adoption of this approach by clinicians and render PRO results meaningful and actionable in routine clinical care. (*J Cardiac Fail 2017;23:813–816*)

Key Words: Quality of life, cardiomyopathy, patient engagement.

Health-related quality of life (QoL), a key aspect of a patient's experience with illness, is at least as important to patients as survival.[1] Although clinicians have traditionally evaluated heart failure (HF) through the association of patient and treatment variables with survival, clinical determinants of biologic disease severity do not always correlate with a patient's QoL, and predictors of survival can differ from predictors of favorable QoL.[2]

To improve the measurement of QoL in HF, there has been considerable interest in assessing patients' health status (assessment of symptom burden; physical, mental, and social function; and overall impact of health on QoL) by means of formal patient-reported outcomes (PROs).[3,4] We think that the use of PROs in routine clinical practice could rapidly quantify a patients' symptoms, function, and QoL and provide a good estimate of prognosis.[5,6] This can be critical in selecting therapeutic strategies that match patient goals[7] and can serve as a foundation for explicitly quantifying how changes in treatment are affecting patients.[8]

The aim of the present study was to determine the feasibility of integrating PRO assessment into

*From the [1]University of Utah School of Medicine, Salt Lake City, Utah; [2]Saint Luke's Mid America Heart Institute, University of Missouri, Kansas City, Missouri and [3]Intermountain Medical Center, Murray, Utah.*Manuscript received May 18, 2017; revised manuscript received September 25, 2017; revised manuscript accepted September 26, 2017.Reprint requests: Josef Stehlik, MD, MPH, U Health, University of Utah, Division of Cardiovascular Medicine, 50 North Medical Drive, 4A100 SOM, Salt Lake City, UT 84132. Tel: 801-585-2340; Fax: 801-581-7735. E-mail: josef.stehlik@hsc.utah.edu.

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routine clinical practice at a large heart failure (HF) clinic.

Methods

Clinical Setting

The setting for this feasibility project was a HF clinic at a tertiary academic medical center in the Western United States, with a patient population including a broad spectrum of HF as well as recipients of heart transplants and ventricular assist devices.

Feasibility Assessment

The metrics of feasibility assessment included examination of practicality of completion of PROs at the time of clinic visit, the time required to complete the selected instruments, and the completion rate. We also examined the feasibility of immediate PRO scoring and integration of the PRO results into the electronic health record (EHR).

This study was approved by the Institutional Review Board at the University of Utah.

Selection of PRO Instruments

We selected disease-specific and generic tools for longitudinal patient status assessment. The short version of the disease-specific Kansas City Cardiomyopathy Questionnaire (KCCQ12) consists of 12 multiple-choice questions and captures symptom frequency, physical and social limitations, and QoL impairment as a result of HF.[9] The KCCQ12 score range is 0-100, and higher scores indicate fewer symptoms, better functioning, and higher QoL. The KCCQ and the Minnesota Living With Heart Failure Questionnaire (MLHFQ) are the best validated disease-specific PROs for HF.[10] We selected the KCCQ12 for its advantage of being shorter, capturing a broader range of clinically important domains, and being more sensitive to clinical change.[3,11] We used 4 instruments from the Patient-Reported Outcomes Measurement Information System (PROMIS)—physical function, fatigue, depression, and satisfaction with social roles and activities—as our generic assessments. PROMIS uses computerized adaptive testing, with scores for each domain scaled from 0 to 100 and normalized to a population mean of 50 and a standard deviation of 10 points.[12–14]

Technical Aspects of Implementation

The technical implementation of PRO capture in the HF clinic was facilitated by the University of Utah My Evaluation (mEVAL) Personal Health Assessment team. The mEVAL web portal uses scheduling information from the EHR to associate patient visits to providers and prompt PRO assessments. Our default setting was to initiate PRO completion at a minimum interval of 3 months in all patients seen in the HF clinic.

We implemented 2 pathways for PRO completion. (1) Online completion of PROs before clinic visit: at 48 hours before a scheduled HF clinic appointment, patients are e-mailed a unique link that allows them to complete the assessment online, using their desktop computer or mobile device. (2) Completion of PROs at the time of clinic visit: for patients who did not complete their PRO assessment online in advance, a Quick Response (QR) barcode generated at registration by a front-end employee loads the PRO instruments onto a portable tablet computer (iPad; Apple, Cupertino, California), and the patients are asked to complete the assessment while waiting to be seen by their provider. The use of the QR barcode allows for an automated determination of what PRO tools are due to be completed and limits the security risk because all of the patient information remains on the computer screen of the front-end employee, with only the PRO tools being displayed on the tablet screen. On completion of the assessment by the patient, the results are uploaded through a secure wireless data transfer and immediately scored. The PRO scores are then integrated back into the patient's EHR (Epic; Epic Systems Corp) and a flow-sheet is populated with the numeric results. In addition, a graphic representation of the serial PRO scores is available: an embedded URL uses the Oracle Business Object interface to plot the current PRO scores along with previous results.

The level of information technology (IT) effort required to complete all the outlined steps is significant. The required level of resources was made available to us by the U Health administration, which made capture of PRO a priority. Generalizability of this approach needs to take into consideration this up-front IT investment.

Education of Clinic Staff and Providers

An important aspect in the implementation process was training of clinic staff and providers in the technical aspects of PRO completion. This training consisted of an online training module, a didactic session by the mEVAL IT staff, and hands-on training. In addition, all of the clinic providers completed a didactic session focused on interpretation of PRO results, delivered by a health status expert (John Spertus, MD). To facilitate updates and address questions, we also equipped the clinic with an instruction manual and an educational card on the interpretation of PRO scores.

Results

Initial Experience With Standardized Implementation of PRO Capture

A summary of the steps taken toward implementation of PRO capture and integration of this process into the clinic is presented in Table 1.

In calendar year 2016, 862 unique patients completed 1,320 PRO assessments (Table 2). In that period, 569 patients completed 1 assessment, 198 patients completed 2 assessments, and 66 patients completed ≥3 assessments. The average time