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Original Article

Predictors of lack of improvement in the left ventricular ejection fraction in patients with congestive heart failure 18 months after commencement of a disease management program: A prospective observational study

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ABSTRACT

Objectives: To investigate baseline factors predictive of lack of improvement in the left ventricular ejection fraction (LVEF) 18 months after the beginning of a disease management program in patients with congestive heart failure.

Materials and methods: Patients in whom congestive heart failure is diagnosed in the cardiology outpatient division in a hospital in southern Taiwan were recruited into a disease management program. Echocardiography was performed at baseline and 18 months after commencement of the program to calculate changes in the LVEF.

Results: Eighteen months after the commencement of the program, 29 of the 76 patients (38%) had no improvement in the LVEF over baseline measurements. Multiple logistic regression analysis indicated a younger age (<70 years), no schooling, not being married, and elevated triglyceride levels (≥150 mg/dL) at baseline were significant and independent predictors of no improvement in the LVEF 18 months after commencement of the program.

Conclusion: Younger age, no schooling, not being married, and elevated triglycerides at baseline emerged as significant and independent predictors of a lack of improvement in the LVEF after 18 months of disease management intervention. These findings can serve as a basis for resource allocation when planning future disease management programs.

1. Introduction

Heart failure is a leading cause of hospitalization and readmission in many parts of the world. Despite advances in pharmacotherapeutic strategies, it remains a major clinical and public health concern because of its high morbidity and mortality [1]. Heart failure disease management programs have shown considerable promise in reducing all-cause mortality and readmission [2]. According to the Disease Management Association of America, disease management can be defined as a system of coordinated health care interventions and communications for populations with conditions in which patient self-care efforts are significant [3]. Typically, a disease management program involves multidisciplinary efforts to improve the quality and cost-effectiveness of care for selected patients with chronic illness. It should include elements such as identification of at-risk populations, a coordinated system of care, support for patient self-care, and a patient and care provider feedback system, with measures of clinical and other outcomes [4]. For example, a randomized controlled trial compared usual care with a disease management program in 71 Taiwanese patients with congestive heart failure. The

Conflict of interest: none.

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program consisted of evaluations and coordination of plans of care during hospitalization and 90 days after discharge from the hospital. The postdischarge follow-up consisted of three telephone counseling sessions and three outpatient educational sessions during the 90-day period. Patient disease awareness, self-care behavior, and quality of life were significantly improved at the end of the intervention. In addition, the mean length of hospitalization was significantly shorter (2.8 days) and the cost of hospitalization was lower (16,018 New Taiwan Dollars) than in patients with usual care. The 90-day readmission rate was also significantly reduced (20.7%) with the intervention [5].

However, not all patients enrolled in a disease management program have the desired positive outcomes at the end of the program and particularly, for some time after the end of the program [6,7]. It would be useful for a disease management team to know in advance what types of patients are less likely to show long-term success at the start of a program so that efforts can be effectively targeted to these patients. However, little is known about the predictive factors for a lack of successful disease management clinical outcomes. The goal of the current study was to identify factors at baseline that were predictive of a lack of improvement in the left ventricular ejection fraction (LVEF) in patients with congestive heart failure 18 months after commencement of a heart failure disease management program.

2. Materials and methods

2.1. Study design

This study used a prospective design to identify factors at baseline that were predictive of a lack of improvement in the LVEF in patients with congestive heart failure 18 months after commencement of a heart failure disease management program.

2.2. Setting and samples

This study was conducted at a regional teaching hospital in southern Taiwan between June 2011 and March 2012. All patients with a diagnosis of congestive heart failure (International Classification of Diseases, 9th Revision, Clinical Modification, ICD-9-CM code 428.0) were referred by cardiologists in the cardiology outpatient division to a disease management nurse. These patients were invited to enroll in a disease management program. The inclusion criteria were as follows: outpatients with a diagnosis of congestive heart failure, age 18 years or older, able to communicate, and consent to participate in the study. Patients who had previously enrolled in similar programs, either at the study hospital or other hospitals, were excluded from the study (Fig. 1).

2.3. Ethical considerations

All participating patients provided informed consent after they were given a full explanation of the study. The study protocol was approved by the institutional review board of the study hospital (No. B10301002).

2.4. Measurements

Self-care behavior was assessed using the European Heart Failure Self-Care Behavior scale (EHFScBS). The scale was developed based on international guidelines for heart failure management and it defines self-care as the strategies undertaken by an

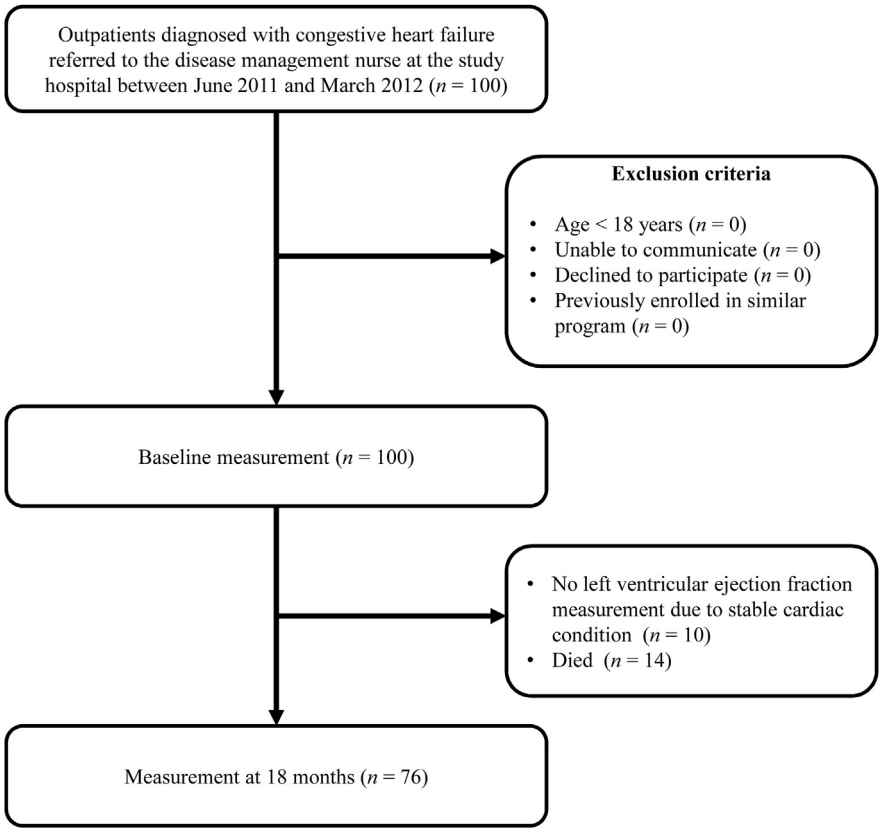

Fig. 1. Flowchart of the study.