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Review

Heart success program: An interdisciplinary patient-centered approach to cancer patients with concurrent heart failure

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ABSTRACT

Heart failure is one of the most dreaded complications of cancer treatment that can result from the cardiotoxic effects of chemotherapy, radiation treatment, and targeted therapies. Heart failure can occur acutely during chemotherapy administration, or it can manifest years after the completion of cancer treatment. Survivors of childhood cancer may develop chemotherapy-induced heart failure several years after completing anthracycline-based treatment. Cancer patients who have a concurrent diagnosis of heart failure experience complex clinical management issues that require a multidisciplinary approach and a close collaboration among oncologists, cardiologists, and the health care team. The Heart Success Program provides a model for engaging cancer patients and family members as partners with a shared goal of reducing the burden of heart failure. The Heart Success Program also creates the reinforcing structure of a team of interdisciplinary health care providers who maintain a clear focus on measuring and improving clinical care processes and patient outcomes. The program holds promise for the creation of similar future initiatives aimed at other chronic health problems that affect individuals with cancer.

1. Introduction

Heart failure is one of the most dreaded complications of cancer treatment that can result from the cardiotoxic effects of chemotherapy [1], radiation [2], or targeted therapies [3]. As new anticancer agents with cardiovascular side effects have entered the therapeutic armamentarium, the risk of heart failure has increased among cancer patients and cancer survivors treated with these agents. Heart failure can manifest acutely after cardiotoxic chemotherapy administration, or it may present up to several years after completion of cancer treatment. Survivors of childhood cancer may develop chemotherapy-induced heart failure anywhere from 4 to 20 years after completion of anthracycline-based treatment [4]. Cancer patients who develop heart failure while receiving cancer treatment have a complex array of clinical management issues that require a multidisciplinary approach. A close collaboration among oncologists, cardiologists, and the health care team is critically important in order for patients to receive the required cancer treatment without experiencing compromised cardiac function. Without close monitoring and follow-up, the patient's quality of life is greatly diminished, anticancer treatment may be therapeutically limited, and may lead to frequent hospital readmissions.

This article discusses the development and implementation of an interdisciplinary, patient-centered, collaborative "Heart Success Program" for the management of cancer patients with concurrent heart failure. It also addresses strategies for improving compliance with the Centers for Medicare and Medicaid Services core measures for heart failure (Fig. 1) and the impact of the Heart Success Program on hospital readmission and patient satisfaction.

2. Defining the Problem of Heart Failure in Cancer Patients

Most cancer patients are in their sixth decade of life [5,6] and often have pre-existing cardiovascular problems before their cancer diagnosis. The development of chemotherapy-induced heart failure is related to the type of antineoplastic agent used. For several decades, drug-induced cardiotoxicity leading to heart failure was almost exclusively associated with the use of anthracyclines. However, a new dimension to the problem emerged when new drugs that target the activity of certain tyrosine kinases or tumor receptors were found to have deleterious effects on the cardiovascular system [3,5]. Moreover, a higher-than-expected incidence of cardiac dysfunction was seen among patients treated with a combination of old and new anticancer agents, such as anthracyclines and trastuzumab, which are used to treat many types of cancer [6]. More than half of patients exposed to anthracyclines will experience some degree of acute or chronic cardiac dysfunction. The dysfunction may arise 10 to 20 years after treatment, and 5% of affected patients will develop overt heart failure [4,7].

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1058-9813/

Set Measure ID #	Measure Short Name
1	Discharge Instructions
2	Evaluation of Left Ventricular Systolic Function
3	Angiotensin Converting Enzyme Inhibitor or Angiotensin II Receptor Blockers for Left Ventricular Systolic Dysfunction

Fig. 1. Centers for Medicare and Medicaid Services heart failure inpatient core measures.

Published data on the number of hospital discharges of patients with cancer and concurrent heart failure are lacking. We used the MD Anderson Cancer Center database to identify hospital discharges of patients with a diagnosis of cancer and concurrent heart failure using the International Classification of Diseases 9 codes 425 (cardiomyopathy), 428 (heart failure), and 429.1 (myocardial degeneration). Of the 53,370 hospital discharges for calendar year 2012–2013, 3.9% (n = 2041) of patients had a discharge diagnosis of cancer and concurrent heart failure. The most common cancer diagnosis among patients with concurrent heart failure is shown in Fig. 2. The 30-day hospital readmission rate in this patient population was 37%, a percentage that is much higher than the 30-day hospital readmission rate of 19.6% reported for Medicare beneficiaries [8] and the risk-standardized unplanned readmission rates of 22.9% (17.1–30.7%) [9].

Compliance with the three inpatient core measures for heart failure required by the Centers for Medicare and Medicaid Services was also reviewed. These measures include: 1) documentation of discharge instructions, 2) evaluation of left ventricular function, and 3) initiation of an angiotensin-converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (if intolerant to ACE-I) for patients with left ventricular systolic dysfunction (defined as a left ventricular ejection fraction of ≤40%). Compliance with heart failure core measures 2 and 3 was 100%; however, compliance with documentation of discharge instructions was poor.

Patients who have cancer and concurrent heart failure typically have several comorbid conditions. The most typical conditions are hypertension, atrial fibrillation, coronary artery disease, myocardial infarction, chronic pulmonary disease, obstructive sleep apnea, renal impairment, diabetes mellitus, systemic infections, thromboembolism, anemia, and cachexia. Any of these comorbidities can unfavorably affect cancer therapeutic options and patient prognosis. These comorbidities also lead to an increased chronic disease burden, which can significantly affect a patient's quality of life. The growing complexity of managing cancer patients with heart failure and multiple comorbidities that require polypharmacy demands an interdisciplinary collaborative approach to improve care.

3. The Heart Success Program

The Heart Success Program was conceived out of a need to coordinate the care of patients with diverse and complex issues that arise when they develop heart failure as a concurrent diagnosis during hospital admission or while receiving cancer treatment. The goals of the program are to: 1) develop patient-centered care with active patient involvement in the management of their illness, 2) improve symptom monitoring and management after hospital discharge, 3) implement evidence-based pharmacologic therapy for heart failure based on American College of Cardiology, American Heart Association, and Heart Failure Society of America clinical practice guidelines, and 4) increase compliance with the Centers for Medicare and Medicaid Services core measures for heart failure.

The theoretical framework for the Heart Success Program is shown in Fig. 3. The patient and family are in the center of the theoretical model, as they are the focal point of the collaborative efforts of the healthcare team. Not only are they the focal point, but the patient and family are also integral members of the team and are encouraged to be active participants in their care.

Healthcare teams are considered to be an integral component of health care delivery and a way to maximize patient care effectiveness and efficiency. Each member of the team plays a key role in the program's implementation.

Nurses are the driving force in the Heart Success Program. In the primary team nursing care delivery model used at MD Anderson, nurses are in a unique position to enhance team functioning and patient outcomes [10]. Nurses work in assigned geographical teams that are overseen by a clinical nurse leader. The clinical nurse leader, a masters prepared nurse, is responsible for developing the professional practice of the nursing team members, serves as a point of contact for the health care team, and reinforce quality improvement strategies to improve outcomes at the microsystem level. The clinical nurse leader develops strong partnerships and facilitates connected continuous care with the interdisciplinary team. During clinical rounds, the clinical nurse leader and the nurse are able to initiate discussions with the team regarding

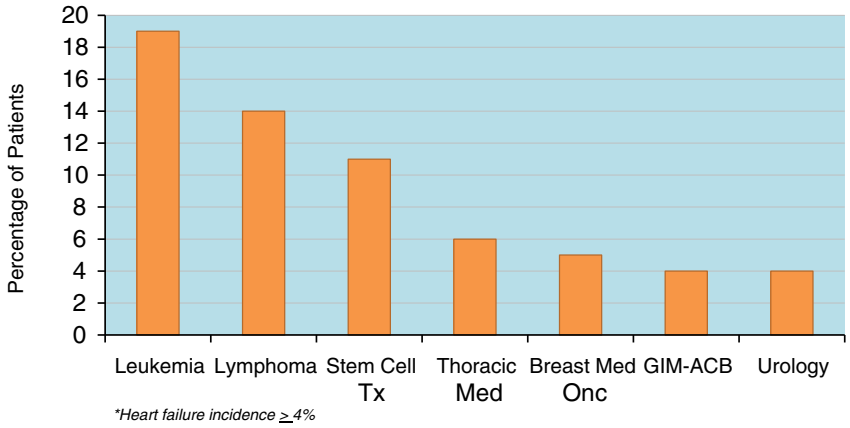

Fig. 2. Cancer diagnosis of patients with heart failure*.