Evidence Report

Chapter 1. Overview

Heart failure (HF) is a clinical syndrome that can result from any cardiac disorder that impairs the ability of the ventricles to fill with and/or eject blood. The syndrome is characterized by signs and symptoms of intravascular and interstitial volume overload, which include shortness of breath and edema and/or manifestations of inadequate tissue perfusion, such as fatigue or poor exercise tolerance.

HF is a common medical condition that has a significant impact on public health. In the United States, an estimated 4.8 million individuals are affected by HF, and 400,000 to 700,000 new cases develop each year.[1] The prevalence of HF increases with age: It is present among 2% of persons age 40 to 59, more than 5% of persons age 60 to 69, and 10% of persons age seventy or older. In addition, a substantial number of individuals with asymptomatic ventricular dysfunction are at risk of developing symptomatic HF. Due to the aging of the American population, the incidence and prevalence of this disease are expected to increase markedly.

HF is associated with substantial morbidity and mortality; it is a primary or secondary cause of death for approximately 250,000 people per year in the United States. According to the 2002 Heart and Stroke Statistical Update (www.americanheart.org), HF was the first-listed diagnosis for 962,000 hospitalizations in 1999, and it is the most common diagnosis among hospital patients age 65 and older. In fact, 20% of all hospitalizations in this age group carry a primary or secondary diagnosis of HF. Over three million outpatient office visits each year are related to this disease. In 1998 alone, the estimated annual direct cost due to HF was $18.8 billion.

A series of studies has established that angiotensin-converting enzyme inhibitors (ACE inhibitors) and beta-adrenergic blocking agents (beta-blockers) provide life-saving benefits in patients with HF or left ventricular systolic dysfunction. However, most of the patients enrolled in such studies have been white males. A clinical question that is consistently asked is whether or not the mortality benefit reported in these clinical trials is also achieved for other subpopulations, such as women, people of other races, and patients with particular comorbidities such as diabetes mellitus or renal insufficiency.

There are several reasons to expect that certain subpopulations might not achieve the same benefits as white males. Research evidence supports a lesser effect on blood pressure in black compared to nonblack hypertensive patients treated with ACE inhibitors,[2] and one of the ACE inhibitor trials reported a lesser effect of ACE inhibitors on reducing hospitalization for black compared to nonblack patients.[3] Similarly, men and women present and respond differently to particular cardiac therapies. Relevant to this topic, a preliminary analysis of one ACE inhibitor study suggested a trend toward lower mortality reduction in women than in men.[4] Since few of the randomized trials enrolled enough women, blacks, or patients with comorbidities to have sufficient statistical power to support conclusions based on subgroup analysis, this question is appropriate for meta-analysis. In additional, if the clinical trial data support a mortality benefit for patients with asymptomatic left ventricular dysfunction, it is natural to question both the cost-effectiveness of such treatment and whether screening asymptomatic patients for left ventricular dysfunction is cost-effective. These clinical and policy questions form the basis for this report.