1-year mortality after first hospitalization for heart failure was similar in patients with preserved or reduced ejection fraction

Bhatia RS, Tu JV, Lee DS, et al. **Outcome of heart failure with preserved ejection fraction in a population-based study.** N Engl J Med. 2006;355:260-9.

Clinical impact ratings: GIM/FP/GP ★★★★★★★ Hospitalists ★★★★★★★ Cardiology ★★★★★☆☆

QUESTION

After a first hospitalization for heart failure (HF), how do the 1-year outcomes of patients with preserved ejection fraction (EF) compare with those of patients with reduced EF?

METHODS

Design: Inception cohort followed for 1 year.

Setting: 103 teaching and community hospitals in Ontario, Canada.

Patients: 880 patients (mean age 75 y, 66% women) with preserved EF (> 50%) and 1570 patients (mean age 72 y, 63% men) with reduced EF (< 40%). Patients were included if they had a first-time hospital admission for HF (defined by Framingham study criteria) between 1 April 1999 and 31 March 2001 and documented evaluation of left ventricular EF at admission. Exclusion criteria were age ≥ 105 years, transfer from another hospital, HF that developed after admission, or severe primary left-sided valvular abnormality. 352 patients with borderline EF (40% to 50%) were omitted from the analysis.

Prognostic factor: EF.

Outcomes: Death from any cause, hospital readmission for HF, and in-hospital complications.

MAIN RESULTS

9945 patients met the criteria for HF, but 6492 did not have EF measured or recorded and 649 were excluded because of severe left-sided valvular disease. Preserved EF was present in 31% of included patients. Compared with patients with reduced EF, patients with preserved EF were older; were more likely to be women; and had lower rates of modifiable cardiac risk factors, peripheral vascular disease, and coronary artery disease. They had higher rates of hypertension, atrial fibrillation, and chronic obstructive pulmonary disease. The presenting signs of HF were similar in the 2 cohorts. At 1 year, the mortality rate was similar in patients with preserved or reduced EF (adjusted hazard ratio 0.88, 95% CI 0.74 to 1.06), as was the rate of hospital readmission for HF (Table). The combined outcome of death or readmission at 1 year occurred less often in the preserved EF cohort (Table). In the hospital, patients with preserved EF were less likely than those with reduced EF to have hypotension or cardiogenic shock, or to require mechanical ventilation. Risks for acute coronary syndromes, cardiac arrest, renal failure, and admission to special care units did not differ between groups.

CONCLUSION

In patients with a first hospitalization for heart failure, the mortality rate at 1 year was similar between those with preserved (> 50%) and reduced (< 40%) ejection fraction.

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Outcomes at 1 year in patients with a first hospitalization for heart failure with preserved (> 50%) or reduced (< 40%) ejection fraction*

Outcomes	Preserved ejection fraction	Reduced ejection fraction	Unadjusted risk ratio (95% CI)	*P* value
Mortality	22%	25%	0.87 (0.75 to 1.01)	0.07
Readmission for heart failure	13%	16%	0.84 (0.68 to 1.03)	0.09
Mortality or readmission	31%	36%	0.86 (0.77 to 0.97)	0.01

*CI defined in Glossary; risk ratio and CI calculated from data in article.

COMMENTARY

Diastolic HF (DHF, "preserved EF") is a well-known yet clinically underrecognized entity (1, 2), brought into the limelight by Bhatia and colleagues in this hospital-based study of incident HF. Their findings confirm that DHF is primarily a disease of the elderly and women with hypertension and that it is clinically indistinguishable from systolic HF (SHF, "reduced EF").

The new and somewhat surprising finding is the similar 1-year mortality in patients with DHF and SHF. Hogg and colleagues reviewed outcomes in DHF in 9 hospital-based studies and noted that patients with DHF "have a better survival at all time points from admission" (3). Population-based studies show nonsignificantly higher mortality in SHF, similar to the findings of Bhatia and colleagues.

Exclusion of 65% of patients for lack of EF data is a major weakness of this study, duly acknowledged by the authors, and may also be a marker of poorer quality care. Possible reasons for the lack of an observed mortality difference include differences in prognosis among excluded SHF and DHF patients, use of mortality-reducing drugs in SHF, misclassification of patients by EF, temporal progression of DHF to SHF, and differences in the receipt of cardiology care between groups.

EF is the basis of the most clinically important classification of HF into SHF and DHF. It is an independent risk factor for mortality (4) and will probably remain a useful tool for prognostic stratification and therapeutic intervention.

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