

Editorial



Prognostic Implications of Changes in Left Ventricular Ejection Fraction and Pulmonary Hypertension in Patients with Heart Failure with Reduced Ejection Fraction

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Conflict of Interest

The authors have no financial conflicts of
interest.

Pulmonary hypertension (PH) is common in patients with heart failure (HF) and is associated with disease progression and unfavorable clinical outcomes.^{1,2)} HF with PH is also associated with more severe symptoms and lower exercise tolerance and has a negative effect on clinical outcomes.³⁾ Although the precise pathogenesis of PH caused by HF remains unclear, PH may occur in response to passive backward delivery as a result of increased left ventricular (LV) filling pressure.^{1,4)} In some HF patients, these passive backward mechanical components of venous congestion can cause irreversible permanent vascular remodeling, owing to pulmonary vasoconstriction, decreased nitric oxide availability and desensitization of natriuretic peptide-induced vasodilation.⁵⁾ Because the main goal of treatment in patients with HF concomitant with PH should be to improve the underlying LV systolic function before considering PH treatment, a significant number of patients with HF with reduced ejection fraction (HFrEF) recover LVEF in response to guideline-directed medical therapy and thereby restore PH.⁶⁾ Therefore, the degree of PH may be not be static, and LVEF as well as PH can change according to treatment during follow-up.

There have been several studies on the effect of PH on HFrEF.^{3,7)} In addition, the prognostic value of change in LVEF through serial measurement of LVEF according to medical therapy in patients with HFrEF was proven in previous studies.^{8,9)} However, those studies did not mention whether PH improved with improvement in LV systolic function, and also little is known about long-term prognosis associated with improved changes in PH and/or LVEF in patients with HF.

In this issue of the *Journal of Cardiovascular Imaging*, Kwon et al.¹⁰⁾ assessed the long-term outcomes of patients with HFrEF concomitant with PH according to improvements in PH and LV systolic function. They showed that patients with both enhancing LVEF and PH had higher major adverse cardio-cerebrovascular accident (MACCE)-free survival rates at 5 years. In addition, patients with improvement in PH regardless of LVEF also had higher 5-year MACCE-free survival rates than with no improvement in PH. However, improvement in PH alone was not an independent predictor of MACCE, but became an independent predictor of MACCE with improvement in LVEF. Thus, Kwon et al.¹⁰⁾ demonstrated that LV systolic

function should first be improved through guideline-directed medical therapy rather than focusing on PH in patients with HFrEF and PH, as described above.

Although this study has limitations of being a single-center study, it has major advantages over other studies in that it had a relatively long observation period of 5 years. Moreover, in response to guideline-directed medical therapy, it is important to note that the group with both LVEF and PH recovery proved the ambiguous prediction that the long-term follow-up prognosis would be the best.

In conclusion, Kwon et al.¹⁰ found that serial echocardiography for evaluating LV systolic function and degree of PH may help predict prognosis in patients with HFrEF concomitant with PH. Further studies are warranted that will evaluate changes in HF symptoms and exercise tolerance in patients with HFrEF concomitant with PH according to improvement in LVEF and/or PH.

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