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Editorial

Myocardial Longitudinal Strain in Prediction of Heart Failure after Acute Myocardial Infarction

Hyemoon Chung, MD

Division of Cardiology, Department of Internal Medicine, Kyung Hee University Medical Center, Kyung Hee University, Seoul, Korea

▸ See the article "Usefulness of Myocardial Longitudinal Strain in Prediction of Heart Failure in Patients with Successfully Reperfused Anterior Wall ST-segment Elevation Myocardial Infarction" in volume 49 on page 960.

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Correspondence to
Hyemoon Chung, MD
Division of Cardiology, Department of Internal Medicine, Kyung Hee University Medical Center, Kyung Hee University, 23 Kyungheedae-ro, Dongdaemun-gu, Seoul 02447, Korea.
E-mail: bluesunny52@gmail.com

ORCID iDs
Hyemoon Chung
https://orcid.org/0000-0002-5615-6245

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Myocardial infarction (MI) is one of the major etiologies of heart failure and a contributor for adverse cardiovascular outcome. In patients with acute MI, left ventricular ejection fraction (LVEF) has been widely used for predicting cardiovascular outcome. Current guidelines state that LVEF is a key prognostic factor and recommend performing routine echocardiography after primary percutaneous coronary intervention to assess LVEF before discharge in all ST-segment elevation MI (STEMI) patients.[1)2)] However, the LVEF is a both preload- and afterload-dependent parameter, whereas strain has been shown to be less affected by loading conditions. In addition, 2-dimensional speckle tracking echocardiography (STE) is relatively less operator dependent and more reproducible than LVEF. Recent studies reported that myocardial deformation imaging by STE after MI predicts cardiovascular outcomes such as new onset heart failure and cardiovascular death.[3-5)] Among STE-related parameters, global longitudinal strain (GLS) most reliably predicted outcome in patients with acute MI.[4)5)] Prognosis of MI is also known to be related to the extent of infarction, and GLS was associated with infarction size at a previous study.[6)] So all these studies have implicated that more intensive follow-up plan is needed when GLS is impaired in patients with acute MI.

In this issue, Lee et al.[7)] reported the results of their investigation of 171 patients with STEMI who underwent primary coronary intervention. The authors selected the patients with anterior STEMI and followed for a long-term period. As most recent studies focused on GLS, the authors also analyzed both GLS and longitudinal strain (LS) of anterior segments in this study. As mentioned before, not only global myocardial function but also degree of regional myocardial injury is important to assess long-term prognosis. The left ventricular (LV) regional systolic function has been proposed for risk stratification in patients with acute MI. Moller et al.[8)] reported that wall motion score index (WMSI) had a greater prognostic power, although both LVEF and WMSI provided prognostic information. Carluccio et al.[9)] also reported that WMSI independently predicted cardiac events in patients with acute MI. Park et al.[10)] reported that both GLS and segmental LS of left anterior descending coronary artery territory were independent predictors of all-cause mortality in patients with anterior-wall MI.

In this study, the investigators classified heart failure into 2 groups; in-hospital and out-hospital heart failure group. However, the predictors of these 2 groups were different; GLS

predicted in-hospital heart failure, and LS of anterior segments predicted post-discharge heart failure. The authors explained that LS can reflect the potential for late recovery or remodeling more accurately than LVEF and GLS, because infarcted myocardium undergoes adverse remodeling in a considerable number of patients after anterior MI. Then, they concluded that LS of anterior segments predicted long-term heart failure events than GLS or LVEF. However, the results of the current study should be cautiously interpreted. In this article, the underlying mechanism of out-hospital heart failure in individual patient is unclear whether it is due to new-onset ischemic event or underlying heart failure aggravation due to LV remodeling or increased hemodynamic loading status. Nevertheless, this study adds evidence that GLS is a significant prognostic factor in patients who underwent acute MI. Additionally, we can recognize that segmental myocardial deformation is also important in predicting prognosis, especially in patients with regional myocardial injury due to acute MI.

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