Letter by Nunez et al Regarding Article, "Longitudinal Changes in Ejection Fraction in Heart Failure Patients With Preserved and Reduced Ejection Fraction"
Eduardo Nunez, Juan Sanchis and Julio Nunez

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Correspondence

Letter by Nunez et al Regarding Article, “Longitudinal Changes in Ejection Fraction in Heart Failure Patients With Preserved and Reduced Ejection Fraction”

To the Editor:

We read with interest the article published by Dunlay et al,1 where the authors examined the longitudinal trajectories of left ventricular ejection fraction in a community-based population of patients with heart failure. For the analysis, the population was stratified by preserved and reduced ejection fraction. As an additional aim, the estimated ejection fraction trajectories were related with mortality using time-varying Cox proportional hazard.

We believe the topic is interesting by unraveling an important aspect of the natural history of heart failure. We also support the authors’ attempt to take advantage of all data collected by using longitudinal methods. There are, however, some methodological aspects of the analysis that we would like to comment. First, the data resulting from this follow-up study seem to be highly unbalanced, with subjects having an unequal number of measurements (ranging 1–30). Assuming high mortality rate as the main factor, because 935 patients (75.8%) died at follow-up, makes imperative the need to account for what is called nonrandom or informative dropout. As a result, such data are not ideally suited for being analyzed using linear mixed effects models.2 There is extensive literature regarding the degree and direction of the bias induced when nonrandom dropout is not accounted for.3,4 Overall, there is an attenuation of the effect of the longitudinal changes on the time-to-event outcome.5 Second, in longitudinal analysis, the continuous exposure is usually measured with error, including analytic error and short-term biological variability. Failure to account for measurement error in a time-varying exposure biases the estimated regression parameters in the proportional hazard model toward the null.3,5

Many methods have been proposed to simultaneously model longitudinal data with time-to-event outcome.6 The highlighted advantages of using a joint modeling approach are the repeated measurements can be extrapolated to recreate the entire longitudinal history; the time-to-event is allowed to depend on the true but unknown value of the longitudinal exposure, thus making an adjustment for measurement error; and the repeated measurements process is adjusted for any loss of information arising from death.

Disclosures

None.

Eduardo Nunez, MD, MPH
Juan Sanchis, MD
Julio Nunez, MD
Servicio de Cardiología
Hospital Clínico Universitario, INCLIVA
Universitat de Valencia
Valencia, Spain

References