

LETTERS TO THE EDITOR

The Question of Incremental Prognostic Value of Doppler Transmitral Flow Patterns in Patients With Congestive Heart Failure

We read with interest the recent report by Xie et al. (1) demonstrating the value of a restrictive transmitral flow pattern as an important single clinical predictor for cardiac death in patients with congestive heart failure. Although the study of diastolic dysfunction remains in its earliest stages, reports of clinical associations are highly relevant.

In Table 2 of their article, the authors report a number of characteristics of the patients studied—many of which are understood to affect the prognosis in patients with heart failure. The associations in this table between a number of readily available and inexpensive variables suggest that at least a portion of the information provided by the Doppler transmitral flow characteristics is already known by the incorporation of clinical history and simple laboratory tests.

Table 3 demonstrates the independent predictors that the authors found of cardiac death by the Cox proportional hazards model, including gender, New York Heart Association functional class and left ventricular ejection fraction. The evaluation of tests in hierarchic order may provide more complete prognostic information and allow a model to evaluate the significance of additional testing to the knowledge already obtained by the clinician (2,3). It would be of interest to determine whether the restrictive transmitral filling pattern remains an independent predictor of events after first considering clinical, laboratory and ejection fraction variables because these will most likely be known before proceeding to Doppler echocardiographic measurements. With this approach, the incremental value of transmitral flow patterns can be better assessed.

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Reply

We thank Evans and Christian for their interest in our report (1). Clearly, the incremental value is an important aspect of any diagnostic test, particularly in this era of cost-containment.

The purpose of our study was to determine whether left ventricular diastolic function, as assessed by Doppler echocardiography, can predict mortality in patients with congestive heart failure. Analysis by the Cox proportional hazards model revealed five independent predictors for cardiac death, as listed in Table 3 of the report (1). Restrictive transmitral flow pattern, female gender and New York Heart Association functional class (IV vs. II) were significantly related to the risk of cardiac death.

Evans and Christian suggest that, using a modified logistic regression approach (2), the incremental value of transmitral flow patterns can be better assessed. The statistical method suggested by Evans and Christian is best suited for a logistic modeling situation in which the patient pool is divided into successes and failures. Our report really identifies covariates associated with patient survival. By definition, the Cox proportional hazards model assumes that each patient in the study will die of heart failure; Table 3 identifies those characteristics associated with a shorter survival time. If we chose a time point (e.g., 1- or 2-year survival), there would be a further problem, such as what to do with those patients who do not have at least 1 year of follow-up. Therefore, the extension of the logistic regression model from the logistic framework to the survival analysis framework is not straightforward.

It certainly would be useful to determine the incremental value of the independent predictors for decreased survival applied with other clinical data in a hierarchic order. In such a way, the cost-effectiveness of the information could be evaluated. Such analysis is not readily achievable from the existing data. However, our data clearly demonstrate that a restrictive pattern of transmitral filling was the best independent predictor of cardiac death.

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