

The Incremental Prognostic Value of Echocardiography in Asymptomatic Stage A Heart Failure

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Abstract

Objective:

This multicenter study consisted of echocardiographic examination of subjects with stage A heart failure (HF) with cardiovascular risk factors and normal electrocardiogram and clinical examination results to (a) define whether stage A subjects with risk factors are really free of functional or structural cardiac abnormalities and (b) assess the impact of the presence of risk factors and incremental value of echocardiographic parameters in the prediction of progression of HF or in the development of cardiovascular events.

Methods:

A total of 1097 asymptomatic subjects underwent echocardiographic examination as a screening evaluation in the presence of cardiovascular risk factors. Left ventricular (LV) dysfunction, both systolic (ejection fraction) and diastolic (transmitral flow velocity pattern), was evaluated according to standard criteria. The subjects were divided according to different criteria: the presence of one or more risk factors, presence or absence of LV systolic dysfunction, and presence or absence of LV diastolic dysfunction. A follow-up period of 26 ± 11 months was performed, observing primary (cardiac death, myocardial infarction, coronary artery bypass grafting, percutaneous transluminal coronary angioplasty, acute pulmonary edema, stroke, and transient ischemic attack) and secondary (cardiologist-made diagnosis of HF and HF hospitalization) end points.

Results:

The multivariate analysis for independent predictors of primary end points showed that age ($P = .001$), gender ($P = .02$), dyslipidemia ($P = .01$), obesity ($P = .001$), and systolic dysfunction ($P = .048$) represented the significant predictors. The multivariate logistic regression analysis for independent predictors of secondary end points showed that gender ($P = .02$), LV systolic dysfunction ($P = .01$), and LV diastolic dysfunction ($P < .01$) represented the significant predictors. The multivariate analysis for independent predictors of combined end points showed that only age ($P < .003$), gender (male: $P < .001$), obesity ($P < .04$), and systolic dysfunction ($P < .001$) represented the significant predictors. Echocardiography showed a high incremental value in the detection of systolic LV dysfunction and the prediction of cardiovascular events during follow-up in subjects with at least two risk factors.

Conclusion:

This study demonstrated that preclinical functional or structural myocardial abnormalities could be detected by echocardiography in asymptomatic subjects with two or more cardiovascular risk factors and without electrocardiogram abnormalities (stage A of HF classification). The presence or absence of LV systolic dysfunction or LV diastolic dysfunction, as demonstrated by echocardiography, has an incremental value to cardiovascular risk factors in predicting both the evolution toward more severe HF stage C and the occurrence of cardiovascular events.

Keywords

Cardiovascular risk factors, Echocardiography, Heart failure