Echocardiographic parameters as predictors of survival in patients with chronic heart failure: the relevance of "classic" parameters in the modern era

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Introduction: Chronic heart failure (HF) has become one of the most prominent health issues of today and despite advances in treatment, HF mortality rates remain high. Echocardiography plays a crucial role in the diagnosis and management of HF patients.[1] The aim of this study was to reevaluate the role of „classic" echocardiographic parameters in predicting the mortality of patients with HF across various cardiomyopathies.

Patients and Methods: We retrospectively analyzed data from 200 patients (71% male, 47.8±11.7y) with mild to moderate chronic HF (NYHA II and IIIa) treated at our Department from December 2010 until December 2014. All patients underwent a standardized echocardiographic examination. Left ventricular systolic/diastolic (LVIDs, LVIDd) and left atrial (LA) dimensions were determined using M-mode analysis in the long-axis parasternal view. Left ventricular ejection fraction (LVEF) was calculated using both 2D measurements and Simpson Biplane method. Right ventricular function was evaluated using tricuspid annular plane systolic excursion (TAPSE). The last patient follow-up was performed via telephone interview, with a mean follow-up period of 44.9±16.5 months. The primary outcome of the study was overall survival.

Results: Most of our patients presented with HF due to ischemic and dilated cardiomyopathy (26.5% and 25% respectively). Overall patient survival was 92.5%. LVIDd, LVEF, LA and TAPSE differed significantly among the survival groups (**Table 1**). When comparing survival curves, LVEF lower than 35%, LA smaller than 4.6 cm and TAPSE lower than 16 mm were all found to be predictive of adverse outcome (**Figures 1**, **2**, and **3**). Regression analysis revealed LVIDd and LA to be the best predictors of mortality in our patient population (Exp(B)=1.8, P=0.038 and Exp(B)=2.0, P=0.037 respectively).

TABLE 1. Comparison of echocardiographic parameters according to survival groups.

ECHO parameter	Patients without primary outcome	Patients with primary outcome	P-value
LVIDd (cm)	6.6±1.1	7.3±0.6	0.022*
LVIDs (cm)	5.5±1.6	5.5±2.1	0.514
LVEF (%)	32.3±14.8	23.9±8.8	0.033*
LA (cm)	4.6±1.0	5.2±0.7	0.032*
E/e'	19.1±13.0	16.0±5.8	0.970
TAPSE (mm)	16.5±4.6	12.8±2.9	0.008*

LVIDd = left ventricular internal diameter end-diastole, LVIDs = left ventricular internal diameter end-systole, LVEF = left ventricular ejection fraction, LA = left atrial diameter, EoEp = E over E prime, TAPSE = tricuspid annular plane systolic excursion.

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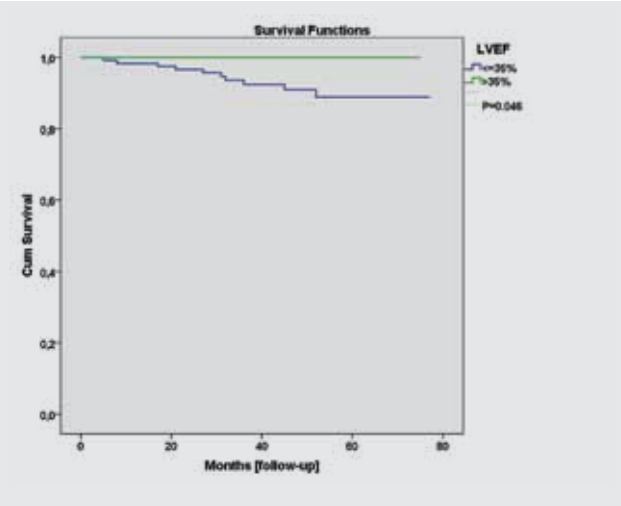

FIGURE 1. Survival curves according to left ventricular ejection fraction (LVEF).

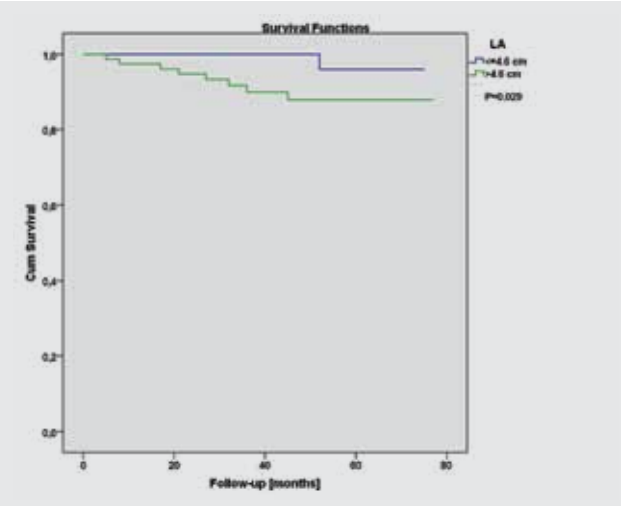

FIGURE 2. Survival curves according to left atrial diameter (LA).

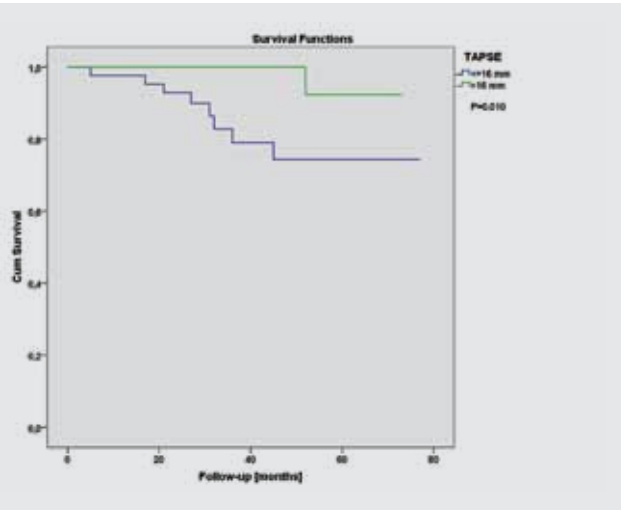

FIGURE 3. Survival curves according to tricuspid annular plane systolic excursion (TAPSE).

Conclusion: Although sometimes considered obsolete in the modern era, „classical", easily obtainable echocardiographic parameters of cardiac structure and function are still reliable predictors of patient mortality in chronic HF. As expected, enlarged LA and LV, as well as reduced systolic function of both ventricles were all associated with adverse outcome.

LITERATURE

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