

## Editorial / Editöryal Yorum

### Predictors of survival in heart failure

#### Kalp yetersizliğinde yaşam öngördürücüleri

**Yüksel Çavuşoğlu, M.D.**

Department of Cardiology, Eskisehir Osmangazi University Faculty of Medicine, Eskisehir

**H**eart failure (HF) is a common clinical syndrome associated with an increased risk of mortality. Although, in general, the 1-year mortality rate is reported as 17% in acute HF patients and 7% in chronic HF patients, it largely depends on the severity of the disease and the implementation of appropriate medical therapy.<sup>[1]</sup> Identifying those patients who have a poor prognosis and for whom intensive pharmacological or device therapy would be most beneficial is of special importance in HF management. Many clinical and laboratory parameters have been identified in predicting survival in patients with HF due to systolic dysfunction (Table 1). The most frequently used predictors of survival are direct or indirect measures of the severity of cardiac dysfunction. In addition to these cardiac parameters, comorbid conditions and the underlying cause of HF are known to be important determinants of poor prognosis.

Although many clinical factors have been found to be correlated with survival on a statistical basis in a large group of patients, their ability in predicting survival in individual patients is limited. Patients with HF often have one or more of these factors of poor survival. As a result, the prognosis in most patients may not be accurately estimated by any individual predictor. Hence, several predictive risk models such as which make use of multiple clinical variables have been suggested in order to achieve better estimations of prognosis. Examples are the Seattle Heart Failure Model or the Heart Failure Survival Score. However,

it is advised that these predictive models should be used to complement rather than replace a physician's clinical judgment, because almost all demographic factors are influenced by age, gender, race, population studied and cause of HF.

Among tens of hundreds of predictors, New York Heart Association functional class, heart rate, blood pressure, echocardiographic measures of left ventricular ejection fraction, right ventricular function, both left and right ventricular enlargement, pulmonary artery pressure, functional mitral regurgitation and measurements of serum creatinine, glomerular filtration rate, serum sodium, natriuretic peptides, cardiac troponins and also comorbid conditions are the most widely used clinical variables for prognosis. In everyday clinical practice, a clinician needs simple, useful, reliable, easy-to-use and inexpensive markers. In this context, Polat et al.<sup>[2]</sup> reported a retrospective analysis that investigated the prognostic value of hematologic parameters in patients hospitalized with acute decompensated HF. They found that reduced hemoglobin level, platelet and lymphocyte counts were independent predictors of 1-year mortality in multivariate analysis. Also, hemoglobin level, red-cell distribution width, platelet, leukocyte, lymphocyte, basophil, neutrophil, monocyte, and eosinophil-counts were found to show prognostic significance in univariate analysis. The authors concluded that these markers, especially hemoglobin level, and platelet and lymphocyte

*Correspondence:* Dr. Yüksel Çavuşoğlu, Eskişehir Osmangazi Üniversitesi Tıp Fakültesi, Kardiyoloji Anabilim Dalı, Eskişehir, Turkey.

Tel: +90 222 - 239 29 79 e-mail: yukselc@ogu.edu.tr

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**Table 1. Adverse predictors in heart failure**

High New York Heart Association (NYHA) functional class
Six-minute walk distance
Elevated heart rate
Low systolic, diastolic and mean arterial blood pressure
S3 gallop
Elevated jugular venous pressure
Cheyne-Stokes respiration and sleep apnea
Reduced left ventricular ejection fraction
Concomitant diastolic dysfunction
Left ventricular dilatation (LVEDVI >120 mL/m <sup>2</sup> )
Increased left atrial size (LAVI >63 mL/m <sup>2</sup> )
Reduced right ventricular ejection fraction
Right ventricular enlargement
Elevated pulmonary artery pressure
Reduced cardiac index
Moderate to severe functional mitral regurgitation
Atrial fibrillation
Ventricular tachycardia
Diabetes
Ischemic heart disease
Renal insufficiency
QRS prolongation and LBBB
Reduced heart rate variability
Low peak VO <sub>2</sub>
High natriuretic peptide levels
Elevated cardiac troponin levels
Galectin-3 and ST-2
Reduced glomerular filtration rate
Elevated blood urea nitrogen
Albuminuria
Hypoalbuminemia and liver function abnormalities
Hyperuricemia
High plasma adiponectin
Low serum cholesterol
Anemia
Iron deficiency
Decreased percentage of lymphocytes
White blood cell count >7000/microL
Elevated red cell distribution width
Erythrocyte sedimentation rate >15 mm/h
Hyponatremia
Elevated norepinephrine, renin, endothelin-1
Weight loss (cardiac cachexia)
Lower body mass index (<30 kg/m <sup>2</sup> )
Lack of hemodynamic improvement with therapy
Attenuated response to diuretics
Depression

counts can be used in the risk stratification of patients with acute decompensated HF.

This is certainly not the first study to show the prognostic value of hematologic parameters in HF. Previously published studies have shown a significant association between anemia and increased mortality in patients with HF. Higher red cell distribution width has also been shown to be strongly associated with mortality.<sup>[3]</sup> Also, a decreased percentage of lymphocyte,<sup>[4]</sup> a white blood cell count >7000/micL<sup>[5]</sup> and even an erythrocyte sedimentation rate >15 mm/h<sup>[6]</sup> have been found to be associated with mortality in HF patients. Therefore, the present paper seems to be a nice addition to the literature surrounding prognostic value of hematologic indices in the risk stratification of acute HF patients, although some caveat should be taken into account when utilizing these markers in clinical practice.

There are many drawbacks to using any individual predictor for prognosis, and many confounders affect the prognostic value of any given parameter. This is especially true for univariate predictors. Although in the paper by Polat et al., hemoglobin level, platelet and lymphocyte counts were found to be independent predictors in multivariate analysis, it is possible that unmeasured confounding variables due to the retrospective design of the study might also have influenced the results. Also, it should be pointed out that the predictive value of these parameters was found in a study population from which so many conditions that might have an impact on hematologic indices were excluded. In clinical practice, it is very difficult to exclude all these factors before using hematologic markers for the prediction of prognosis. For instance, before using a low hemoglobin level for predicting prognosis in HF, all other reasons for anemia should be excluded.

Moreover, there is uncertainty about the cut-off point of these markers. The extent to which a decrease or increase in these parameters is clinically meaningful remains unclear. Although there is a statistically significant difference between those with a worse prognosis and those with a good prognosis, these markers are oftentimes found to be within the normal range. Therefore, statistical significance does not necessarily mean clinical significance in any individual patient. Thus, it is very hard to speak of a better or worse prognosis in a patient who has normal

platelet or lymphocyte levels. As a result, the prognosis for most patients may not be accurately reflected by these parameters in clinical practice and may be used only as supplementary information.

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