

# Prognostic value of NT pro BNP and echocardiographic indices of diastolic function in patients with heart failure and preserved left ventricular ejection fraction

Rocío Blanco<sup>1\*</sup>, Rodolfo Pizarro<sup>1</sup>,  
Cesar Belziti<sup>1</sup>, Giuseppe  
Ambrosio<sup>2</sup>

<sup>1</sup>Department of Cardiology, Italian Hospital of Buenos Aires, Buenos Aires, Argentina

<sup>2</sup>Department of Cardiology, University of Perugia, Perugia, Italy

\*Author for correspondence:  
Rocío Blanco, Department of Cardiology,  
Italian Hospital of Buenos Aires, Buenos  
Aires, Argentina, E-mail: rocio.blanco@  
hospitalitaliano.org.ar

Received date: January 11, 2021

Accepted date: January 25, 2021

Published date: February 01, 2021

**Keywords:** Acute heart failure • Heart failure with preserved ejection fraction • Natriuretics peptides • Diastolic dysfunction

## Background:

Heart failure syndrome is an important cause of morbi-mortality worldwide, and near half of these patients have preserved ejection fraction. Although there is a clear relationship between heart failure decompensation and natriuretic peptides serum levels, guiding the treatment based on these biomarkers alone is not accurate enough. We describe the capacity of discriminating patients with high risk of death and readmission with the combined analysis of natriuretic peptides and echocardiographic variables in the setting of heart failure with preserved ejection fraction.

## Commentary

The main cause of hospital admission and loss of quality of life in Heart Failure (HF) patients is the progressive and persistent systemic congestion.

Although it is known the relationship between high Natriuretic Peptides (NP) levels, the different echographic signs of high left ventricular diastolic pressure and other clinic signs of pulmonary and systemic congestion, until now, the medical treatment strategy guided by systemic NP levels has not shown to be cost effective [1].

Identifying those patients with indirect signs of volume overload, such as elevated ventricular filling pressures by echo or/and very high levels of NP, will allow us to discriminate those patients who will have an unfavorable prognosis during follow-up. Particularly in the acute HF setting, residual systemic congestion before hospital discharge is a risk factor for early readmission and short-term death [2].

We evaluated first admission for HF and preserved left ventricular ejection fraction patients (HFpEF: left ventricular ejection fraction >50%) [3]. The aim of our study was to determine the predictive value of NT proBNP and some echocardiographic parameters of diastolic dysfunction for readmission and death in this subset of patients with this first episode of HFpEF. We analyzed multiple clinical, echocardiographic and laboratory variables; we focus our interest in describing the prognostic utility of the combination of E/e' ratio and NT proBNP in this particular cohort.

We prospectively included 205 consecutive patients with 28 ± 10 months of follow up. Eighty two patients reached the primary combined end point: thirty patients (14.6%) died and seventy two (35%) were re hospitalized because of heart failure.

In the multivariable analysis, the predictors of the combined end point were: E/e' ratio at discharge ≥ 14 (HR: 4.63, CI 95%: 2.71-18.2, p<0.0001), NT-proBNP at discharge ≥ 1500 pg/ml (HR: 5.23, CI 95%: 2.87-17.8, p<0.0001) and ≥ 50% NT-proBNP reduction between admission and hospital discharge (HR: 0.62, CI 95%: 0.25-0.79, p=0.019). Using the ROC curve for the combination of the first two variables improved the precision of the model compared with the variables separately

## Commentary

(ROC NT-proBNP at discharge: 0.80; E/e' ratio  $\geq 14$  at discharge: 0.77; E/e' ratio  $\geq 14$  at discharge+NT proBNP>1500 pg/ml at discharge: 0.88  $p<0.01$ ).

Since the persistence of direct and indirect signs of systemic congestion has already shown to be an important prognostic marker, and as we demonstrated the additional value of NT proBNP and E/e' ratio in this population of acute HF with preserved ejection fraction: We think that our work adds more important objective tools to discriminate this HFpEF patients with an increase of filling pressures and myocardial stress despite the instituted treatment. Closer surveillance and frequent clinical monitoring might avoid the progression of congestion.

In the setting of a clinical syndrome such as HFpEF, in which no treatment has been found that significantly reduces the mortality, it is essential to reclassify the risk of these patients as part of a therapeutic strategy that pursues the objective of avoiding hospital readmissions and death, with the consequences for individual and public health.

## Conclusion

In patients with heart failure and preserved ejection fraction hospitalized because of their first acute decompensation, the evaluation of diastolic echocardiographic parameters together with serological biomarkers, measured both before hospital discharge, provides prognostic information on top of this variables alone, and facilitates the identification of a population with a higher risk of subsequent death or rehospitalization for heart failure.

## References

1. Rodeheffer RJ. Measuring plasma B- type natriuretic peptide in heart failure: Good to go in 2004? *J Am Coll Cardiol.* 44(4): 740-749 (2004).
2. Boersma EM, Maaten JMT, Damman K, et al. Congestion in heart failure: A contemporary look at physiology, diagnosis and treatment. *Nat Rev Cardiol.* 17(10): 641-655 (2020).
3. Blanco R, Ambrosio G, Belziti C, et al. Author links open overlay panel Prognostic value of NT-pro BNP and echocardiographic indices of diastolic function in hospitalized patients with acute heart failure and preserved left ventricular ejection fraction. *Int J Cardiol.* 317: 111-120 (2020).