18th European Congress of INTERNAL MEDICINE
29-31 August, 2019
Lisbon, Portugal
Innovation in Health Care: New Opportunities for Internal Medicine
EFIM www.efim.org

#409

CAN CLASSIC BIOMARKERS BE PROGNOSTICATORS IN HEART FAILURE? - DATA FROM THE REFERENCE STUDY

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BACKGROUND: Although the role of natriuretic peptides and troponins as risk stratification markers is gaining importance, the current state of scientific knowledge does not allow to affirm that they are definitely established for the prognostic evaluation of heart failure (HF).

OBJECTIVE: We explored the relationship of aminoterminal b-type natriuretic peptide (NT-proBNP) and highly sensitive troponin t (hsTNT) with short-term prognosis (defined as the period of 90 days post-discharge), namely readmission due to HF and overall death, and long-term overall death.

METHODS: NT-proBNP and hsTnT were assessed in patients hospitalized with acute decompensated heart failure in class III or IV of New York Heart Association (NYHA). Comparison between patients with and without each of the events was performed for all variables using t-test or Wilcoxon Rank test as applicable. Categorical variables were summarized by relative and absolute frequencies, and compared using chi-squared test or Fisher's Exact test as applicable. Univariate Cox proportional hazard model was used to evaluate the relationship between variables and outcomes. The optimal cut-off value for each biomarker to predict the events was defined using the Youden Index. The Spearman's correlation coefficient was used to determine the relationship between variables.

RESULTS

N=65 HF patients
Mean age: 79.2 (SD 10.8)

Median follow-up: 13.7 months
[Q1: 6.7 to Q3: 18.9]

Characteristics	Patients (n=65)
Age, mean (SD)	79.2 ± 10.8
Female Gender, n (%)	37 (56.9)
Hypertension, n (%)	58 (89.2)
Type 2 Diabetes, n (%)	25 (38.5)
Dyslipidemia, n (%)	41 (63.1)
Obesity, n (%)	17 (26.2)
Atrial Fibrillation, n (%)	28 (43.1)
Family History of CVD, n (%)	31 (47.7)
Tabagism, n (%)	21 (32.3)
Chronic Kidney Disease, n (%)	34 (52.3)
GFR (Baseline), median	57.8 (43.8 - 82.2)
GFR (Admission), median	47.9 (33.2 - 68.1)
Previous Acute Myocardial Infarction, n (%)	27 (41.5)
Hypertensive Cardiomyopathy, n (%)	44 (67.7)
Ischemic Cardiomyopathy, n (%)	22 (33.8)
Valvular Cardiomyopathy, n (%)	56 (86.2)
LVEF, mean (SD)	50.38 ± 19.07
NYHA class III, n (%)	43 (66.2)
ACE Inhibitor, n (%)	43 (66.2)
Beta Blocker, n (%)	38 (58.5)
Mineralocorticoid Receptor Antagonists, n (%)	19 (29.2)
Angiotensin II Receptor Blocker, n (%)	11 (16.9)
Loop Diuretic, n (%)	54 (83.1)
Digoxin, n (%)	8 (12.3)
hsTnT, median	51.0 (31 - 117)

Values are median (IQR), n (%), or mean±SD. IQR: interquartile range and minimum/maximum, SD: standard deviation, CVD: cardiovascular disease, GFR: glomerular filtration rate, ACE: Angiotensin-Converting-Enzyme.

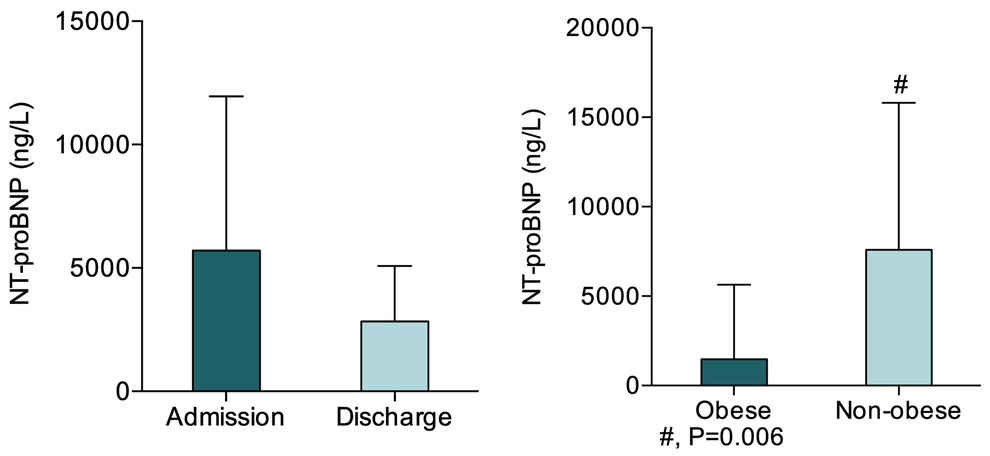


Figure 1: Admission and discharge NT-proBNP levels and its association with obesity.

NT-proBNP at admission to hospitalization

	Cut-off	NPV	PPV
NT-proBNP	21336 ng/L	0.91	0.64

Youden Index

- Spearman's correlation showed an inversely proportional relation between NT-proBNP and LVEF (Coefficient: r = -0.365, P-value = 0.004).
- The same statistical method evidenced an inverse correlation between NT-proBNP and baseline and admission GFR (Coefficient: r = -0.418, P-value<0.001 for baseline GFR and Coefficient: r = -0.438, P-value <0.001 for admission GFR).

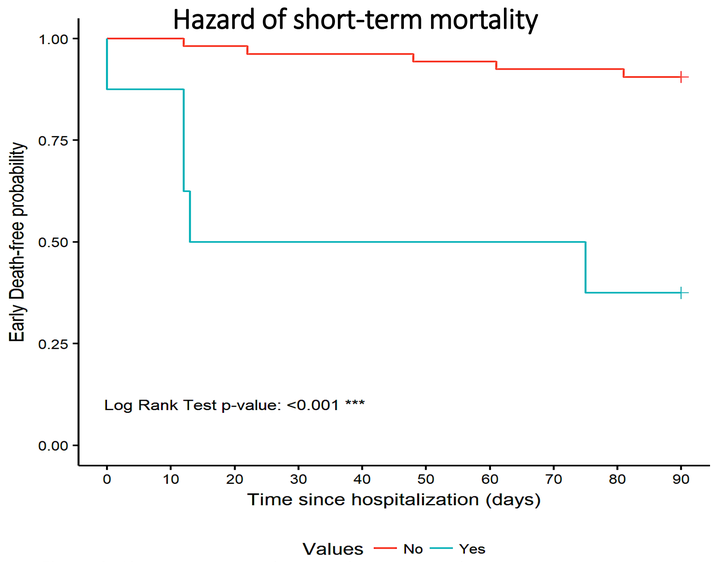


Figure 2: Short-term mortality - Kaplan Meier: Admission NT-proBNP ≥21336 ng/L

0.5%

NT-proBNP admission: 100 ng/L
[HR: 1.005, 95% CI: 1.002-1.009, P-value=0.002]

10.5 fold

NT-proBNP admission Cut-off: 21336 ng/L
[HR: 10.524, 95% CI: 3.013-36.757, P-value<0.001]

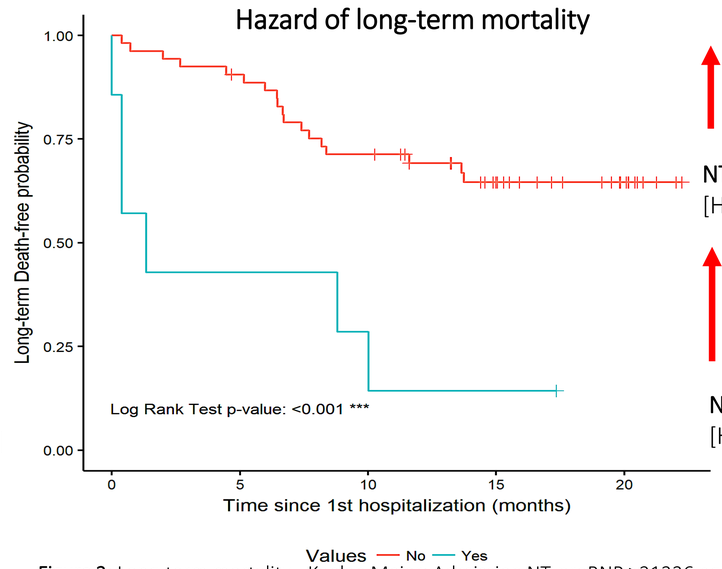


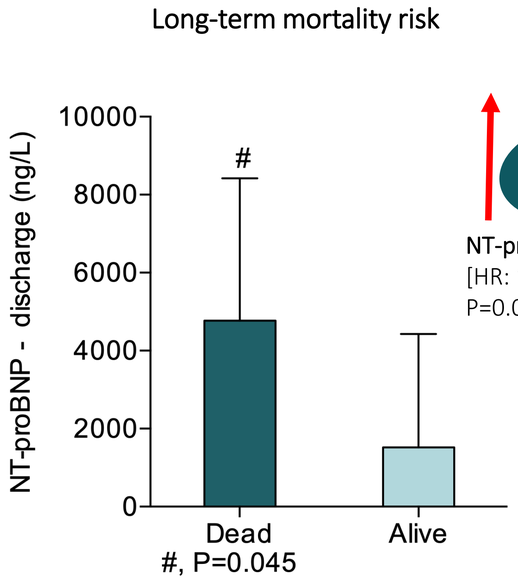
Figure 3: Long-term mortality - Kaplan Meier: Admission NT-proBNP ≥21336 ng/L

0.3%

NT-proBNP admission: 100 ng/L
[HR: 1.003, 95% CI: 1.001-1.006, P-value=0.013]

5-fold

NT-proBNP admission Cut-off: 21336 ng/L
[HR: 4.791, 95% CI: 1.885-12.178, P-value<0.001]



0.6%

NT-proBNP discharge: 100 ng/L
[HR: 1.006, 95% CI: 1.001-1.011, P=0.028]

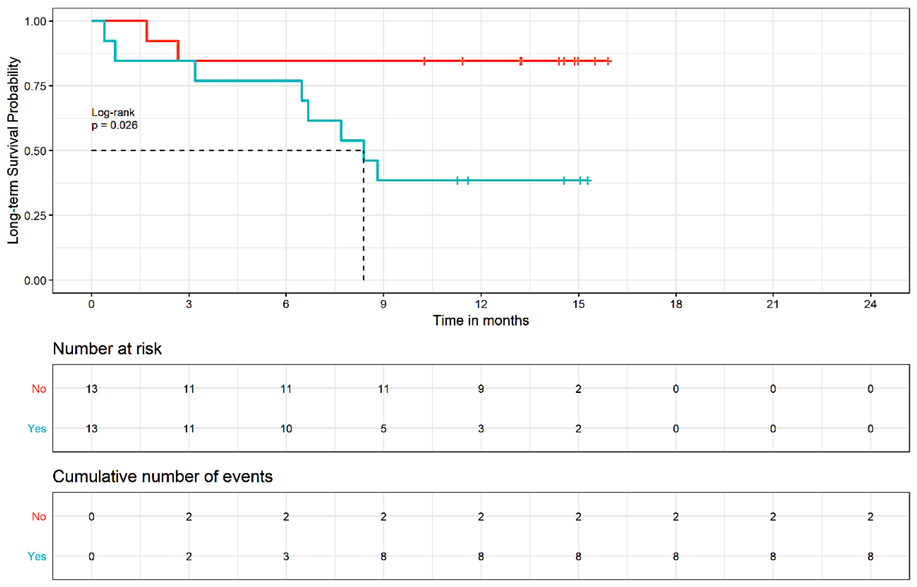


Figure 4: Baseline comparison of subjects by long-term mortality status: Discharge NT-proBNP.

Figure 5: Long-term mortality - Kaplan Meier: hsTnT ≥52 ng/L.

hsTNT at admission to hospitalization

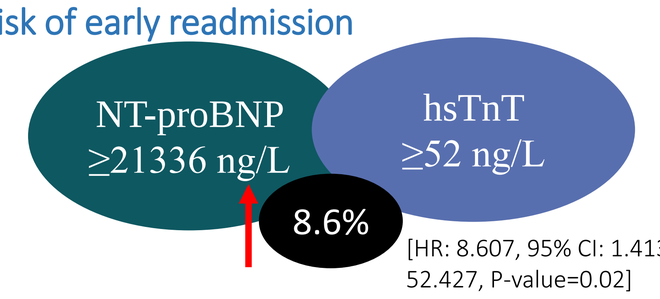
	Cut-off	NPV	PPV
hsTNT	52 ng/L	0.85	0.62

Youden Index

7.7%

Long-term mortality risk
hsTNT admission: 10 ng/L
[HR: 1.077, 95% CI: 1.007-1.151, P-value=0.030]

Risk of early readmission



[HR: 8.607, 95% CI: 1.413-52.427, P-value=0.02]

- As for long-term mortality, values of hsTnT ≥52 ng/L aggravated the hazard close to 5 times (HR: 4.942, 95% CI: 1.044-23.388, P value=0.044), which heightened to almost 6 times if NT-proBNP at admission ≥21336 ng/L was considered (HR: 5.827, 95% CI: 1.168-29.075, P value=0.032).

CONCLUSION: Elevated NT-proBNP and hsTNT determinations correlated with short and long-term outcomes. Moreover, the combined evaluation of the myonecrosis marker and of the myocardial stretch peptide provided complementary prognostic data, since we could not achieve a link with risk of early readmission when each biomarker was assessed isolatedly. The mortality hazard associated to elevated admission NT-proBNP was greater in the early post-discharge period weaning along with follow-up, which fundaments the theory that the first 90 days post-discharge are critical. We highlight that elevated discharge values of NT-proBNP posed a greater long-term mortality risk than admission concentrations, which supports the utility of serial determinations and that, probably, aiming a lowest NT-proBNP as possible during hospitalization could be advantageous.