20th IFCC-EFLM Europaen Congress of Clinical Chemistry and Laboratory Medicine – 19-23 May 2013 – Milano, Italy

DIAneering
DIAGNOSTICS ENGINEERING

The POC assay PATHFAST NTproBNP for risk stratification and decision making in the emergency department

W046

Compoesu-Preozu, D[1], Spanuth, E[2]

[1)]County Hospital SF Spiridon Iasi, Iasi, Romania
[2)] DIAneering®, Diagnostics Engineering & Research GmbH, Friedrichstr. 26, 69221 Heidelberg-Dossenheim, Germany

Background: NT-proBNP testing of patients presenting with acute dyspnea in the emergency department (ED) has been shown to improve stratification and clinical management (1). Aim of our study was to examine the utility of the point of care (POC) assay PATHFAST NTproBNP (2) in patients admitted to the medical ED for any symptom or disease potentially requiring hospitalization.

Methods: A prospective multicentre trial was conducted in 8 romanian hospitals to examine the effect of NT-proBNP on hospitalization rate, intensive care unit (ICU) admission rate, mortality and re-hospitalization during 6 month follow-up (FU). NT-proBNP was measured immediately in whole blood samples obtained from patients at presentation in the ED after inclusion. Inclusion criteria were age > 50 years without limitations with respect to the presenting symptoms.

PATHFAST NTproBNP

Assay Principle	MAGTRATION® -CLEIA
Assay Time	approx. 17min
Sample	whole blood/plasma (Heparin, EDTA)
Assay Range	15 – 30000 ng/L

Results: 282 patients were enrolled in the study. Mean age was 69 years. Median NT-proBNP concentration was 1390 (95% CI: 1080-1992) pg/ml. 17% of patients presented with NT-proBNP < 300 ng/L (low), 25% between 300 and 1000 pg/ml, and 58% with NT-proBNP > 1000 pg/ml (high). The combined endpoint death or readmission during FU was 31% and 15% in patients with high and low NT-proBNP, respectively. The patients were assigned into 4 diagnosis groups: ischemic heart disease (IHD), non-ischemic heart disease (HF), lung disorders (PD/DVT/PE) and others with NT-proBNP median values of 990, 2170, 1524, and 674 pg/ml, respectively (see Tab. 1 and Fig. 2).

Tab. 1: Diagnoses of the study population

Diagnosis	*N, %*
1: Confirmed or suspected ischemic heart disease including ACS and ischemic heart failure (IHD)	**43 (*15,2%*)**
2: Nonischemic heart disease including arrhythmias, valvular heart disease and cardiomyopathies (HF)	**123 (*43,6%*)**
3: Lung disorders including asthma, COPD, thromboembolic disorders and pulmonary embolism (PD/DVT/PE)	**77 (*27,3%*)**
4: All other diseases (others)	**39 (*13,8%*)**

Tab. 2: NT-proBNP levels (ng/L) and study endpoints

Endpoint	N	%	Mean	95% CI	Median	95% CI
Discharge at home	138	49	2815	2051-3580	1261	977-1718
Hospitalization	144	51	6512	3310-9716	2947	1393-6640
ICU admission	7	2.5	7154	2688-16996	3427	202-19190
Survivors	265	94	2717	2141-3293	1006	838-1481
Non-survivors	17	6	13088	4515-21560	4665	1153-30000
Re-hospitalization	98	35	3115	2190-4040	1292	927-2126
No re-hospitalization	184	65	3185	1736-4633	1143	901-2004

Tab. 3: Follow-up outcome with NT-proBNP concentration

Quartile	NT-proBNP (ng/L)	Non-survivors N, %
1st	19-469	0
2nd	470-1382	2 (***12%***)
3rd	1398-4071	6 (***35%***)
4th	4120-30000	9 (***53%***)

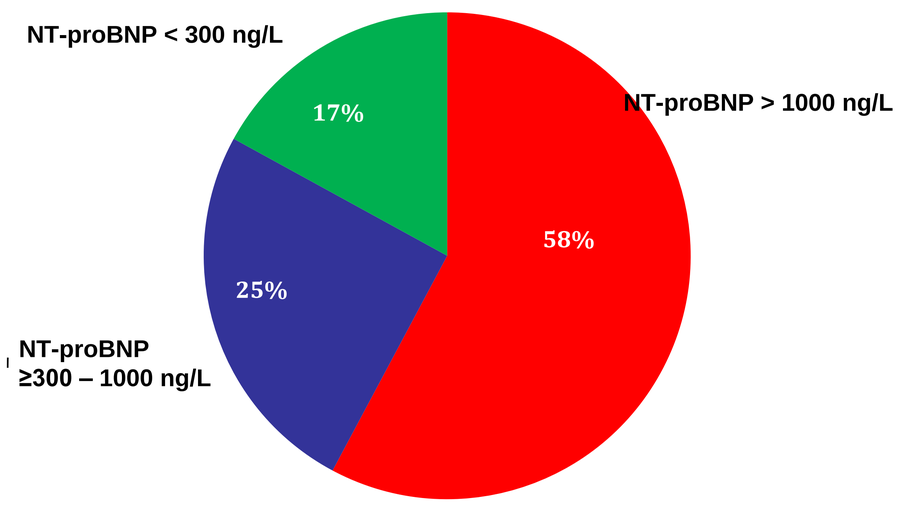

Fig. 1: Proportion of patients and NT-proBNP concentration ranges

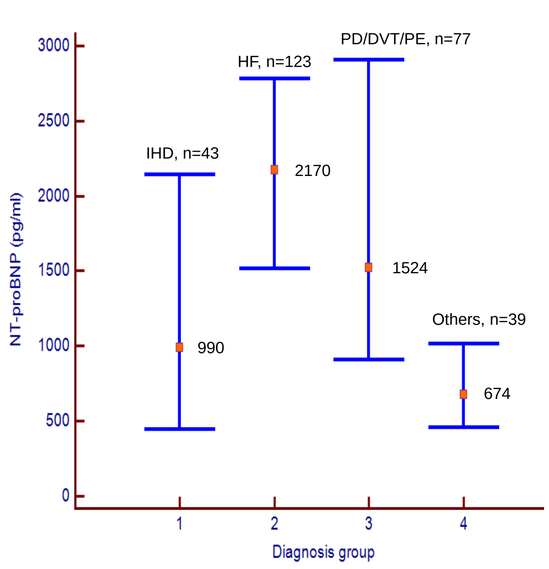

Fig. 2: NT-proBNP in the diagnosis groups (Means, 95% CI)

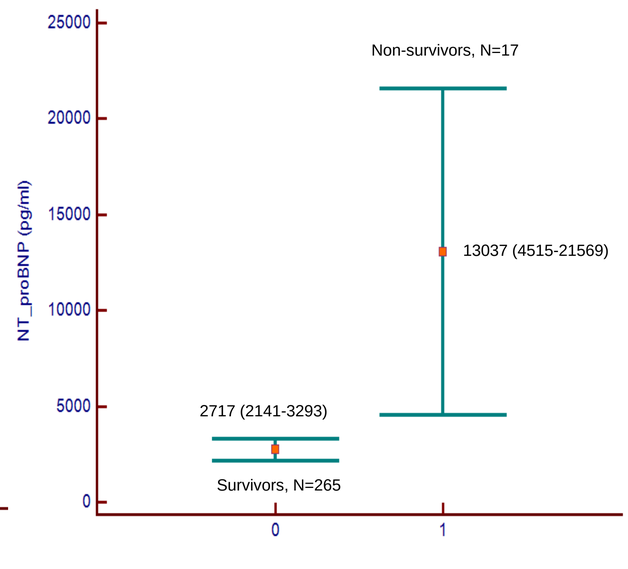

Fig. 3: NT-proBNP concentration (Means, 95% CI) in survivors and non-survivors

Conclusion:
Death or readmission was 31% in patients with high NT-proBNP compared to 15% with low NT-proBNP.

Near patient determination of PATHFAST NTproBNP in the emergency room may improve risk stratification and the management of patient care regarding hospital and ICU admission.
NT-proBNP < 300 ng/L might help to identify low risk patients, whereas patients with NT-proBNP > 1000 ng/L need intensified care.