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Elevated NT-pro BNP predicts Heart Failure re-hospitalizations after an acute coronary syndrome

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Background: NT pro-BNP is a well-established biomarker of tissue congestion and has prognostic value in patients with heart failure (HF) and, also, with acute coronary syndrome (ACS). Nonetheless, there is scarce evidence on the predictive capacity of NT pro-BNP for HF re-admission after an ACS.

Objective: To test whether elevated values of NT pro-BNP can predict subsequent hospitalizations for HF in patients discharged after an ACS.

Methods: We performed a prospective study of all patients discharged after an ACS in a single center. HF re-admission was analysed by competing risk regression, taking all-cause mortality as a competing event, and results are presented as sub-Hazard Ratio (sHR); recurrent hospitalizations were tested by negative binomial regression and results are presented as incidence risk ratio (IRR).

Results: We included 1,679 patients, mean age 70.1 (29.7) year, 71.9% males, 41.4% STEMI and mean GRACE score 151.7 (44.4). Median NT pro-BNP was 948.2 pg/ml (IQ range 274.5–2923) and patients were divided in <300U (27.0%), 300–600 pg/ml (13.4%), 600–1000 pg/ml (10.8%) and >1000 pg/ml (46.7%) A total of 132 (5.9%) died within hospitalization and follow-up was available 98% of the patients, with a median follow-up of 33 months (IQ range 16–59). A total of 220 patients (13.1%) had at least one hospital re-admission of HF and 126 (7.5%) had more than one re-hospitalization for HF. Patients with NT pro-BNP had higher un-adjusted HF re-admissions (22.2% vs. 4.4%; $p<0.01$). Cardiovascular mortality increased significantly in each category of NT pro-BNP (3.8%; 8.0%; 7.7%; 18.5%) as well as all-cause mortality (0.1%; 12.4%; 11.6%; 25.3%), first HF readmission (2.7%; 7.1%; 5.5%; 23.5%); patients with NT pro-BNP had higher rates of recurrent HF readmissions: 11.6/1000 vs. 2.4/1000 patients/years ($p<0.01$). Multivariate analyses, adjusted by age, gender, GRACE score, left ventricle ejection fraction, revascularization and medical treatments at discharge, identified that NT pro-BNP >1000 pg/ml was associated to HF re-hospitalization (sHR: 2.60 95% CI 1.12–5.95) and recurrent hospitalizations (IRR: 1.10 95% CI 1.04–1.14).

Conclusions: NT pro-BNP >1000 pg/ml is an accurate risk factor for first and recurrent HF rehospitalisations after an ACS.