

Poster presentation

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## N-terminal fragment of proBNP is a marker of risk for right ventricular dysfunction and cardiac complications in thalassemia major

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### Introduction

Cardiac complications are the main cause of morbidity and mortality in thalassemia major (TM). In particular, thalassemic cardiomyopathy include forms with right involvement difficult to detect by usual approach, whereas early diagnosis could permit early treatment and improvement in prognosis. Plasma N-terminal fragment of proBNP (NT-proBNP) concentration holds a known value in asymptomatic cardiac patients, too, but its usefulness in the management of TM has not been fully investigated.

### Purpose

Aim of our study was to assess both diagnostic and prognostic role of NT-proBNP in a large prospective cohort of TM patients, evaluated by cardiovascular magnetic resonance (CMR).

### Methods

176 TM patients (age  $30 \pm 9$  years, 54% females) underwent consecutively CMR (1.5 T) and blood sampling for plasma assay of NT-proBNP (ECLIA method). Myocardial iron overload was assessed using a multislice multiecho T2\* approach able to provide the global T2\* value in the left ventricle. Cine sequences were obtained to quantify biventricular morphological and functional parameters. RV and LV volumes and ejection fraction (EF) were evalu-

ated by a semi-automatic software (Mass Plus, Leiden, NL). Myocardial fibrosis was evaluated by late gadolinium-enhanced (Gadovist®; Bayer Schering Pharma; Berlin, Germany) acquisitions. Fibrosis extent was evaluated visually using a two-point scale: enhancement absent or present.

### Results

NT-proBNP was associated positively with right ventricular (RV) end systolic volume ( $r = 0.2$ ,  $P = 0.045$ ) and negatively with RV ejection fraction (EF) ( $r = -0.2$ ,  $P = 0.001$ ). The fibrosis group showed significantly higher NT-proBNP values vs the no-fibrosis group (median, 25th-75th percentile 171, 67-330 ng/l vs 71, 32-134;  $p = 0.038$ ). No correlation was observed between NT-proBNP levels and myocardial iron overload. Patients with cardiac complications (heart failure, arrhythmias, pulmonary hypertension) showed higher NT-proBNP, as compared to patients without complications (108, 58-183 vs 64, 40-110;  $p = 0.003$ ). Considering abnormal NT-proBNP values ( $> 157$  ng/L), odds ratio for RV dysfunction (EF  $< 49\%$ ) was 15 (3-80, OR 95%CI), and for cardiac complications 3 (1.1-7.8 OR 95%CI).

### Conclusion

In TM patients NT-proBNP was significantly associated with RV global systolic function and presence of myocar-

dial fibrosis. Abnormal NT-proBNP significantly predicts RV global systolic dysfunction and cardiac complications. These data suggest a clinical role for NT-pro-BNP assay in the anaemic TM population.

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