

POSTER PRESENTATION

Open Access

# Left ventricular global function index and left ventricular mass volume ratio by CMR: relation with heart failure in Thalassemia major patients

Antonella Meloni<sup>1\*</sup>, Petra Keilberg<sup>1</sup>, Stefania Renne<sup>2</sup>, Gianluca Valeri<sup>3</sup>, Elisabetta Chiodi<sup>4</sup>, Vincenzo Positano<sup>1</sup>, Roberto Sarli<sup>5</sup>, Carla Cirotto<sup>6</sup>, Mari Giovanna Neri<sup>1</sup>, Alessia Pepe<sup>1</sup>

From 18th Annual SCMR Scientific Sessions  
Nice, France. 4-7 February 2015

## Background

Recently two novel indicators of left ventricular (LV) performance assessed by Cardiovascular Magnetic Resonance (CMR) have been introduced: the LV global function index (LVGFI) and the LV mass/volume ratio (LVMVR). The LVGFI combines LV stroke volume, end-systolic and end diastolic volumes, as well as LV mass, integrating structural as well as mechanical behaviour. Elevated LVMVR is indicative of concentric remodelling. A LVGFI <37% and a LVMVR >1 were shown to be associated with the occurrence of cardiovascular events in no-thalassemic populations.

This retrospective cohort study aimed to systematically evaluate in a large historical cohort of thalassemia major (TM) in the CMR era whether the LVGFI and the LVMVR were associated with a higher risk of heart failure.

## Methods

We considered 812 TM patients (391 M, 30.4±8.6 years), consecutively enrolled in the Myocardial Iron Overload in Thalassemia (MIOT) network. LVGFI and LVMRI were quantitatively evaluated by SSFP cine images. The T2\* value in all the 16 cardiac segments was evaluated and a global heart T2\* value <20 ms was considered indicative of myocardial iron overload (MIO).

## Results

Eighty (9.9%) patients had a LVGFI <37% and, compared to the patients with a normal LVGFI, they showed a significant higher frequency of heart failure (43.8% vs 4.2%; P < 0.0001). Patients with a LVGFI <37% had a significant

higher risk of heart failure (odds-ratio-OR=17.59, 95% CI=9.95-21.09; P < 0.001). The risk remained significant also adjusting for the presence of MIO (OR=15.54, 95% CI=8.05-26.27; P < 0.001).

Thirty (3.7%) patients had a LVMVR ≥ 1% and, compared to the patients with a normal LVMRI, they showed a significant higher frequency of heart failure (20.0% vs 7.7%; P = 0.015). Patients with a LVMVR ≥ 1% had a significant higher risk of heart failure (OR=3.01, 95%CI=1.18-7.64; P=0.021). The risk remained significant also adjusting for the presence of MIO (OR=3.44, 95%CI=1.31-9.01; P=0.012).

In a multivariate model including LVGFI, LVMVR and heart iron, the significant predictors of heart failure were a LVGFI <37% (OR=14.05, 95%CI=7.66-25.77; P < 0.001) and a global heart T2\* <20 ms (OR=1.94, 95% CI=1.08-3.47; P=0.026).

## Conclusions

In TM patients a LVGFI <37% was associated with an higher risk of heart failure, independent by the presence of MIO. A widespread program using CMR exploiting its multi-parametric potential can have considerable power for the early identification and treatment of patients at risk for heart failure.

## Funding

The MIOT project receives “no-profit support” from industrial sponsorships (Chiesi Farmaceutici S.p.A. and ApoPharma Inc.).

## Authors' details

<sup>1</sup>CMR Unit, Fondazione G. Monasterio CNR-Regione Toscana, Pisa, Italy.  
<sup>2</sup>Struttura Complessa di Cardioradiologia-UTIC, P.O. “Giovanni Paolo II”,

<sup>1</sup>CMR Unit, Fondazione G. Monasterio CNR-Regione Toscana, Pisa, Italy  
Full list of author information is available at the end of the article

Lamezia Terme, Italy. <sup>3</sup>Dipartimento di Radiologia, Azienda Ospedaliero-Universitaria Ospedali Riuniti "Umberto I-Lancisi-Salesi", Ancona, Italy. <sup>4</sup>Servizio Radiologia, Ospedaliera-Universitaria Arcispedale "S. Anna", Ferrara, Italy. <sup>5</sup>Centro Microcitemia, ASL Taranto Presidio Ospedaliero Orientale "M. Giannuzzi", Manduria, Italy. <sup>6</sup>Servizio trasfusionale, Azienda USL n° 1, Sassari, Italy.

Published: 3 February 2015

doi:10.1186/1532-429X-17-S1-P346

**Cite this article as:** Meloni et al.: Left ventricular global function index and left ventricular mass volume ratio by CMR: relation with heart failure in Thalassemia major patients. *Journal of Cardiovascular Magnetic Resonance* 2015 **17**(Suppl 1):P346.

**Submit your next manuscript to BioMed Central and take full advantage of:**

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at  
[www.biomedcentral.com/submit](http://www.biomedcentral.com/submit)

