

Poster presentation

Open Access

## MRI assessment of correlation between cardiac biventricular function, myocardial iron overload and pancreatic iron overload in a large cohort of thalassemia major patients

Gennaro Restaino<sup>\*1</sup>, Antonella Meloni<sup>2,3</sup>, Vincenzo Positano<sup>2</sup>, Massimiliano Missere<sup>1</sup>, Caterina Borgna Pignatti<sup>4</sup>, Aurelio Maggio<sup>5</sup>, Marcello Capra<sup>6</sup>, Antongiulio Luciani<sup>7</sup>, Gianluca Valeri<sup>8</sup>, Giuseppina Sallustio<sup>1</sup> and Alessia Pepe<sup>2</sup>

Address: <sup>1</sup>Catholic University, Campobasso, Italy, <sup>2</sup>MRI Lab, "G. Monasterio" Foundation and Institute of Clinical Physiology, Pisa, Italy, <sup>3</sup>CNR, Pisa, Italy, <sup>4</sup>University of Ferrara, Ferrara, Italy, <sup>5</sup>"V. Cervello" Hospital, Palermo, Italy, <sup>6</sup>"G. Di Cristina" Hospital, Palermo, Italy, <sup>7</sup>G Garibaldi Hospital, Catania, Italy and <sup>8</sup>Azienda Ospedaliero-universitaria Ospedali Riuniti, Ancona, Italy

\* Corresponding author

from 13th Annual SCMR Scientific Sessions  
Phoenix, AZ, USA. 21-24 January 2010

Published: 21 January 2010

*Journal of Cardiovascular Magnetic Resonance* 2010, **12**(Suppl 1):P286 doi:10.1186/1532-429X-12-S1-P286

This abstract is available from: <http://jcmr-online.com/content/12/S1/P286>

© 2010 Restaino et al; licensee BioMed Central Ltd.

### Introduction

$\beta$ -Thalassaemia major is a hereditary anaemia characterized by ineffective erythropoiesis and haemolysis. By the age of 3 months, severe anaemia develops leading to increased intestinal iron absorption. To maintain haemoglobin at acceptable levels, patients need to be given repeated blood transfusions. A major drawback of this treatment is transfusional siderosis, which, in association with other mechanisms, leads to iron overload. The iron accumulates primarily in the liver and spleen, later on in the heart and the endocrine glands. Increased iron deposition is cytotoxic and may cause organ dysfunction. The leading cause of death in these patients is cardiac failure, but impairment of the endocrine and exocrine function of the pancreas is a common complication.

The use of non-invasive techniques for monitoring iron overload in the affected organs is advisable. Multiecho T2\* MRI is a well established technique for heart and liver iron overload assessment. There are few reports on the use of MRI to study iron deposits in the pancreas and on the correlation between pancreatic siderosis and myocardial iron overload and function.

### Purpose

To describe the T2\* values of the pancreas in patients with beta-thalassemia major; to investigate the correlation between pancreatic and myocardial siderosis; to investigate the correlation between pancreatic iron overload and biventricular cardiac function.

### Methods

Study population: 147 consecutive thalassemia major patients enrolled in the Myocardial Iron Overload in Thalassemia network, an Italian network constituted by thalassemia and MRI centers. MRI was performed using a 1.5-T MRI scanner. Myocardial T2\* was measured with a fast-gradient-echo multi-echo sequence with ECG triggering. Biventricular function was quantitatively evaluated with a steady-state free precession cines acquired during 10 s breath holds in sequential 8 mm short axis slices from the atrio-ventricular ring to the apex. Pancreatic T2\* was measured with a gradient-echo multiecho sequence. Analysis on T2\* images was performed with a dedicated software.

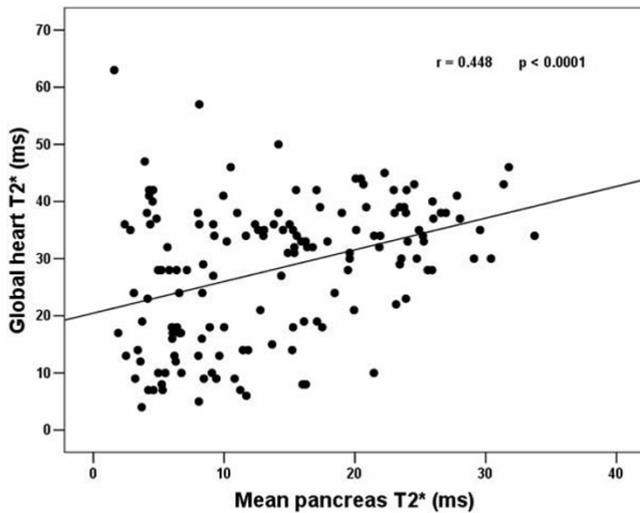


Figure 1

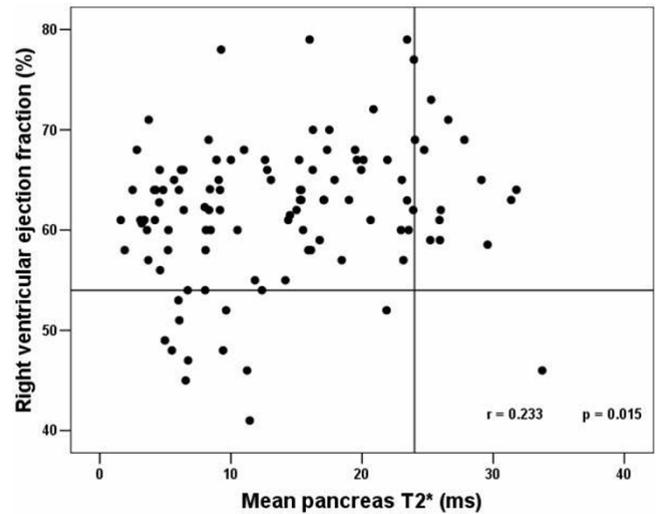


Figure 3

**Results**

The pancreatic T2\* value did not show a significant difference amongst men and women and increased weakly with age in a significant manner. Significant positive correlations of the pancreatic T2\* were demonstrated for global heart T2\* value (Figure 1), number of segments with normal T2\* and T2\* value in the mid-ventricular septum. Pancreatic T2\* value was positively related with LV (Figure 2) and RV (Figure 3) ejection fractions.

**Conclusion**

Pancreatic iron overload is positively correlated to myocardial iron overload and negatively correlated to biventricular systolic function.

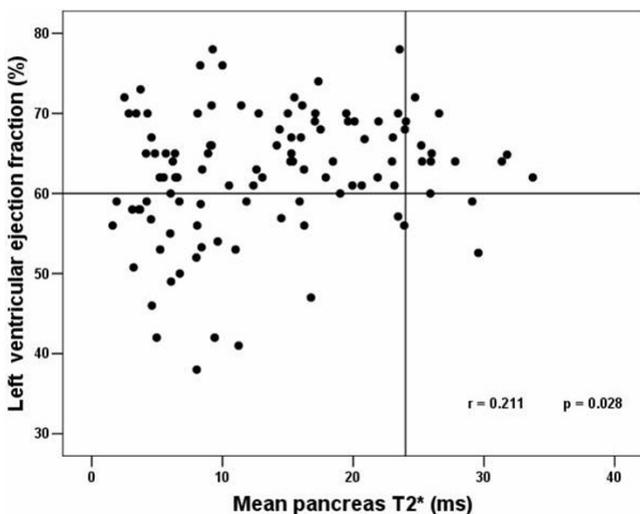


Figure 2

Publish with **BioMed Central** and every scientist can read your work free of charge

*"BioMed Central will be the most significant development for disseminating the results of biomedical research in our lifetime."*

Sir Paul Nurse, Cancer Research UK

Your research papers will be:

- available free of charge to the entire biomedical community
- peer reviewed and published immediately upon acceptance
- cited in PubMed and archived on PubMed Central
- yours — you keep the copyright

Submit your manuscript here:  
[http://www.biomedcentral.com/info/publishing\\_adv.asp](http://www.biomedcentral.com/info/publishing_adv.asp)