MYOCARDIAL TISSUE CHARACTERIZATION BY CARDIAC MR IMAGING IN MYELODYSPLASTIC SYNDROMES

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Objectives

Magnetic Resonance Imaging (MRI) provides unique insight regarding tissue characterization in the heart.

Quarta G et al. The British Journal of Radiology 2011;84:S296–S305

We reported the baseline MRI findings at the end of the recruitment in the MIOMED (Myocardial Iron Overload in MyElodysplastic Diseases) study. In particular, we evaluated the distribution of iron overload in the whole left ventricle (LV) and he presence of myocardial fibrosis in patients with myelodysplastic syndromes (MDS); the association with LV function was also investigated.

No data are available in the literature about this issue.

MIOMED

Methods: patients

MIOMED is an observational, MRI multicentre study in low and intermediate-1 risk MDS patients who have not received regular iron chelation therapy.

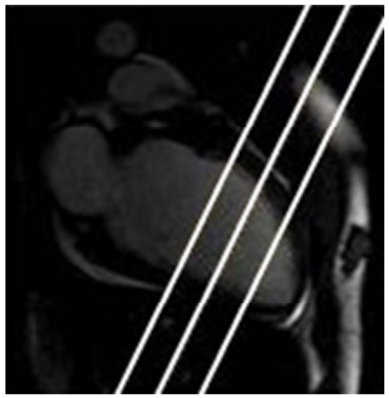
Out of the 51 MDS patients enrolled, 48 underwent the baseline MRI exam.

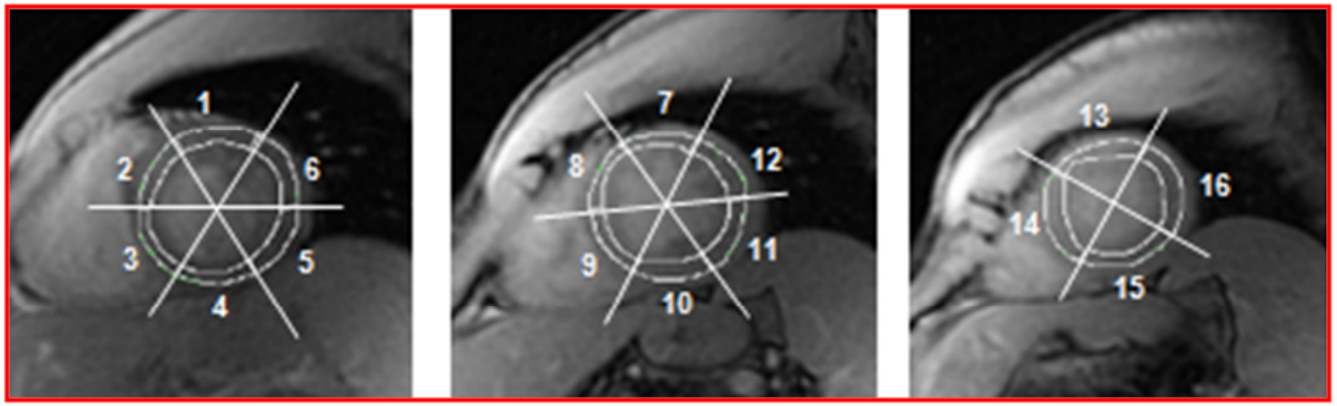
Mean age was 71.7 ± 8.5 years and 17 patients were females.

MIOMED

Methods: MRI

- MIO assessed using a multislice multiecho T2* approach.





Basal		Medium		Apical	
Anterior	1.	Anterior	7.	Anterior	13.
Anteroseptal	2.	Anteroseptal	8.	Septal	14.
Inferoseptal	3.	Inferoseptal	9.	Inferior	15.
Inferior	4.	Inferior	10.	Lateral	16.
Inferolateral	5.	Inferolateral	11.		
Anterolateral	6.	Anterolateral	12.		

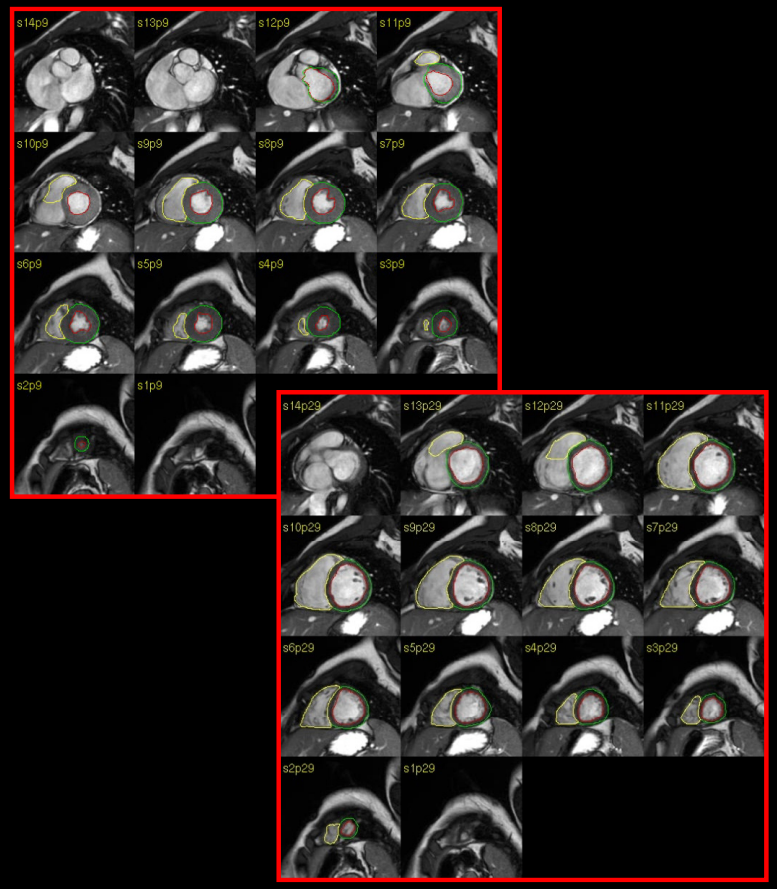
Pepe A et al. JMRI 2006;23:662-8.

Meloni A et al. Magn Reson Med 2010;64:211-9.

MIOMED

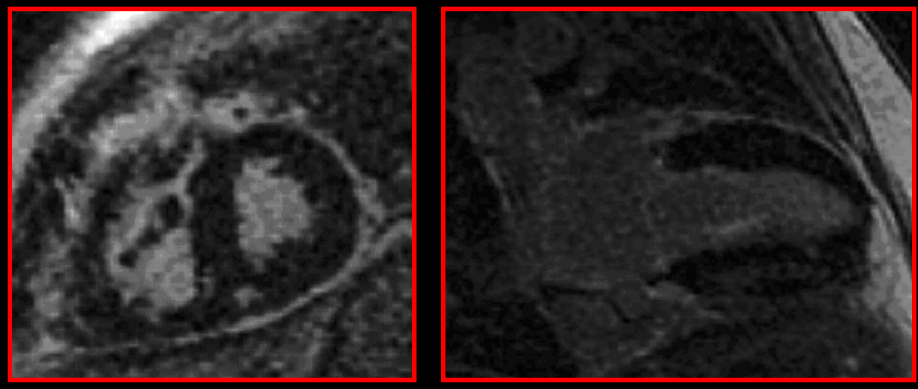
Methods: MRI

- **Biventricular function parameters quantified by cine sequences.**



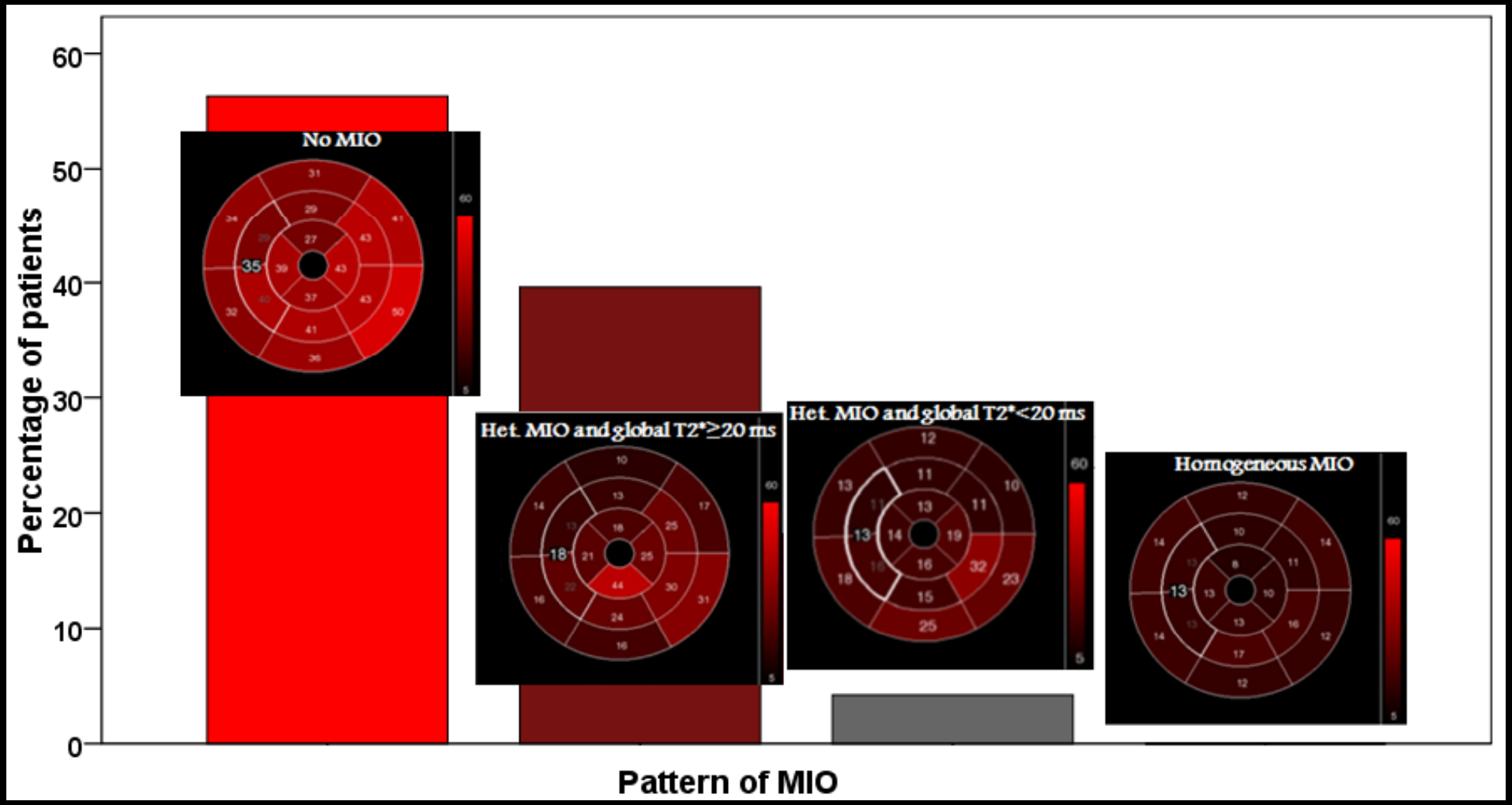
Marsella M et al. Haematologica 2011;96:515-20.

- **Myocardial fibrosis evaluated by late gadolinium enhancement (LGE) acquisitions.**



Pepe A et al. Heart 2009;95:1688-93.

Results: MIO


Percentage of patients
60
50
40
30
20
10
0
No MIO
Het. MIO and global T2*≥20 ms
Het. MIO and global T2*<20 ms
Homogeneous MIO
Pattern of MIO

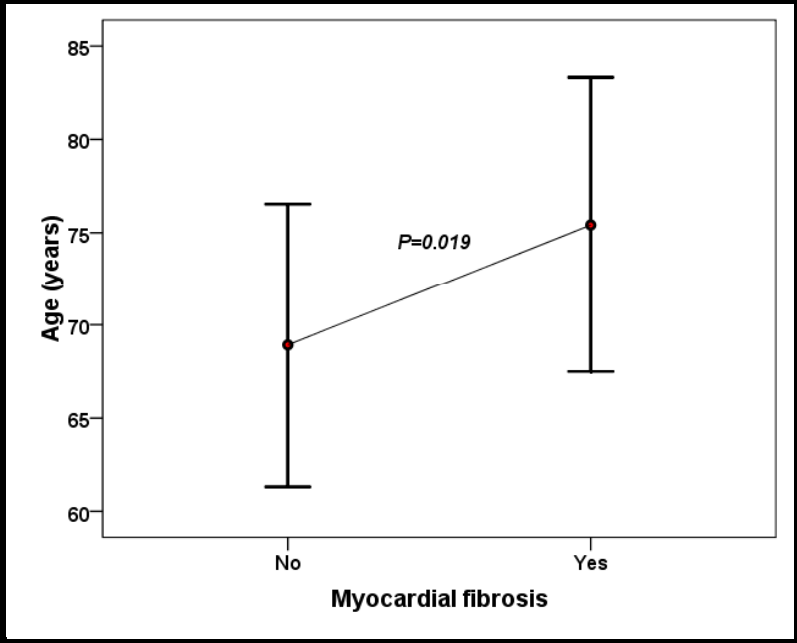
Results: function

- ✓ Reduced LV ejection fraction (EF) found in the 29.5% of cases .
- ✓ Reduced RV EF detected in the 23.3% of cases.

No significant association between heart T2* values and LV EF!

Results: fibrosis

- 35.9% of patients with myocardial fibrosis.
- Three patients with an ischemic pattern and only one had a positive history for a previous myocardial infarction.
- Majority of the patients with two or more foci of myocardial fibrosis, involving more frequently the septal segments.
- Patients with myocardial fibrosis significantly older.
  Global heart T2* and LV volumes not significantly different.
  LV EF lower in fibrotic patients but statistical significance not reached (58.4 ± 11.7 vs 64.8 ± 8.9 %; P=0.067).



Conclusions

Although a significant heart iron was found only in two cases, nearly half the patients had abnormal T2* values in at least one myocardial segment. ⇨ This finding underlines the importance to use a multislice approach in order to perform an early diagnosis and prevent a more diffuse iron distribution by chelation therapy.

This goal could be critical in patients with myocardial fibrosis that seems to be a relative common findings in the old MDS patients. In fact, an underlying heart damage as represented by fibrosis could make the hearts of the old MDS patients more sensitive to lower levels of accumulated iron.

MIOMED