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Are the preferential patterns of myocardial iron overload preserved at the CMR follow-up?

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Background

T2* multislice multiecho cardiac magnetic resonance (CMR) allows quantification of the segmental distribution of myocardial iron overload (MIO). This study aimed to determine if a preferential pattern of MIO was preserved between two CMR scans in thalassemia major (TM) patients.

Methods

Among the 812 TM patients with a CMR follow-up (FU) study at 18±3 months, we selected 259 patients with significant MIO at baseline (global heart T2* <26 ms). Three short-axis views of the left ventricle were acquired and analyzed using a 16-segment standardized model. The T2* value on each segment was calculated, as well as the global value. Four main circumferential regions (anterior, septal, inferior and lateral) were defined.

Results

The selected patient population was divided into two groups: severe (N=80, global T2* < 10 ms) and mild-moderate MIO (N=179, global T2* 10-26 ms).

For each group, there was a significant improvement in the global heart as well as in regional T2* values (P<0.0001 for all the pairwise comparisons).

For the whole patient population as well as for both two groups, at basal the mean T2* value over the anterior region was significantly lower than the mean T2* values over the other regions and the mean T2* over the inferior region was significantly lower than the T2* values over the septal and the lateral regions. The same pattern was present at the FU, with a little difference for patients with mild-moderate MIO (see figure).

Conclusions

A preferential pattern of iron store in anterior and inferior regions was present at both basal and FU CMRs, with an increment of T2* values at FU due to a basal CMR-guided chelation therapy. The anterior region seems to be the region in which the iron accumulates first and is removed later. Our data confirm the segmental T2* cardiac MR approach useful for identifying early iron deposit and for tailoring chelation therapy.

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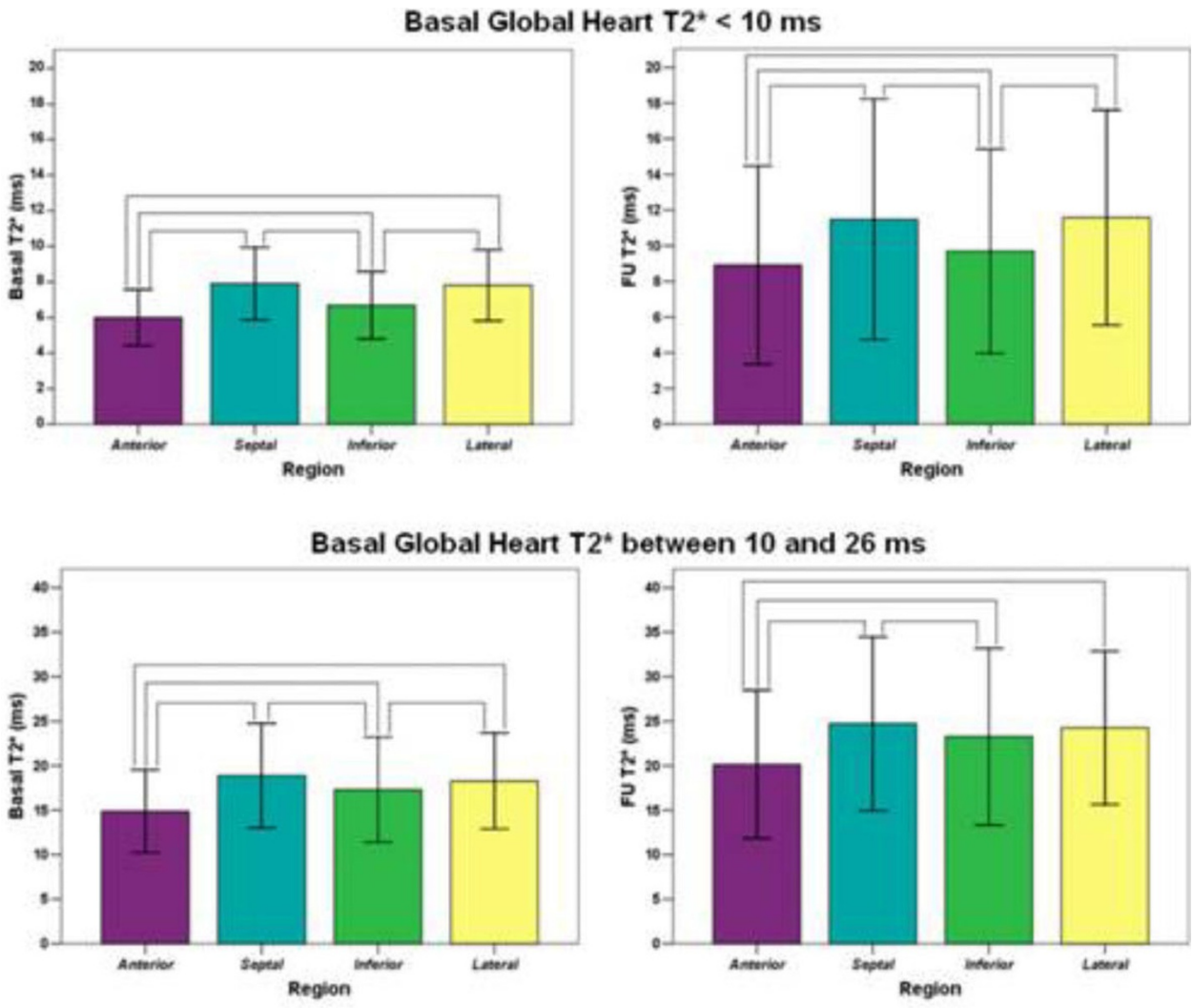
Basal Global Heart T2* < 10 ms
Basal T2* (ms)
FU T2* (ms)
Anterior
Septal
Inferior
Lateral
Region
Basal Global Heart T2* between 10 and 26 ms
Basal T2* (ms)
FU T2* (ms)
Anterior
Septal
Inferior
Lateral
Region

Figure 1