parameters, LV mass, scan time and report time were evaluated in each patient for both sequences. Differences between functional parameters and LV mass were made with a paired Student's T test; correlation between parameters was assessed with Pearson's correlation coefficient. A Bland-Altman analysis was used to investigate the limits of agreement between the measurements. Differences between time-efficiency related parameters were made with a paired Student's T test.

Results: Functional parameters and mass were significantly different in the two sequences ($p < 0.05$) but a strong correlation was found for LV ejection fraction ($r = 0.96$) and good correlation for other functional parameters (r between 0.83 and 0.93). Scan time was significantly lower for 3D sequence, report time was significantly higher for 3D sequence.

Conclusion: 3D k-t BLAST sequence can be used to assess EF in patients who have poor compliance in performing multiple apnoeas and in patients who are not able to remain in the scanner for a long time. Conversely report time is significantly higher for 3D sequence.

O100

CMR T2* technique for segmental and global quantification of myocardial iron: multi-centre transfereability and healtcare impact evalaution

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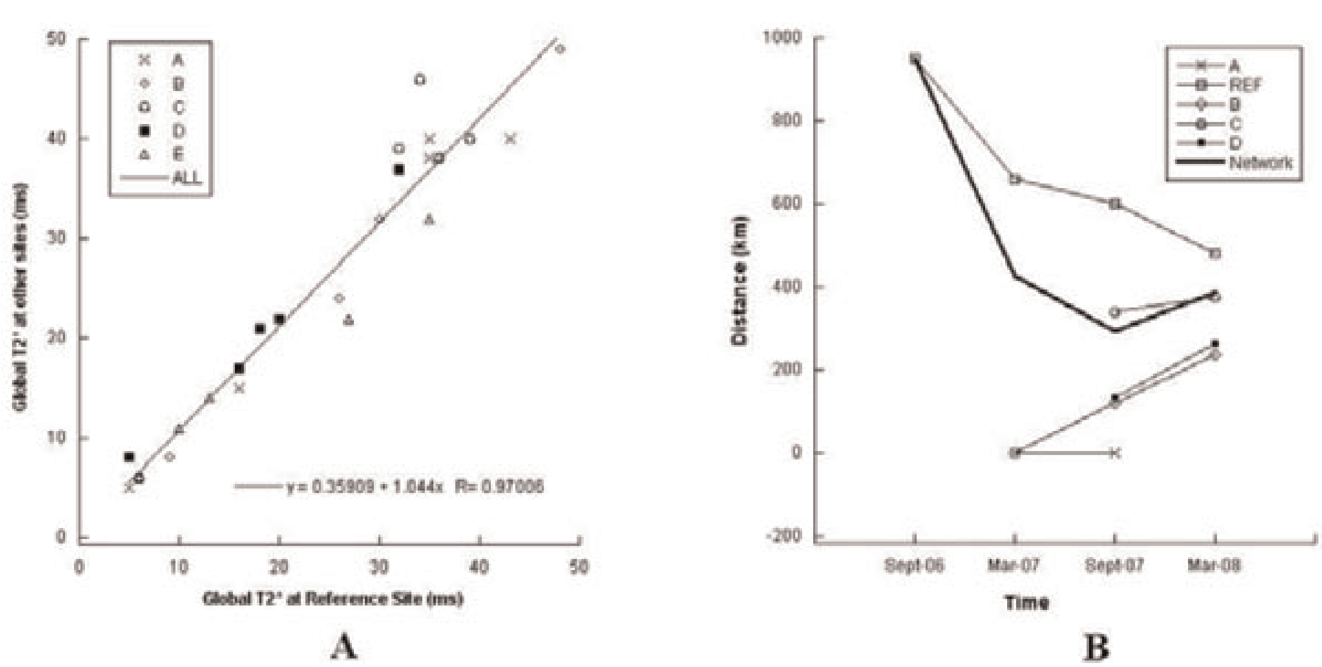
Introduction: Iron induced cardiomiopathy is the main cause of mortality in thalassemic population. Thus, the improvement of chelation regimens, to reduce cardiac disease, has the highest priority. Efficient evaluation of cardiac iron status and careful epidemiologic assessment of thalassemic patients play an important role in this matter. T2* cardiac magnetic resonance imaging (CMR) is a unique technique to quantify myocardial iron overload and useful to tailor the chelation therapy. In particular, effective and reproducible assessment of myocardial iron loading using the multislice multiecho T2* approach for segmental and global myocardial iron distribution has been demonstrated within a single CMR site. Thalassemia major (TM) patients require lifelong myocardial iron load monitoring to assess the effectiveness of chelation therapies. Hence, it is highly desirable that CMR be performed near the patients' locations, and that the patients be able to safely move between different CMR centers.

Purpose: Aim of this work is to build a reliable network of haematological and paediatric centers specializing in thalassemia care and MRI sites able to perform feasible and reproducible heart iron overload assessments for a consistent number of thalassemia patients in a standardized and robust manner.

Materials and methods: In order to assess the transferability of the multislice multiecho T2* technique, heart multislice multiecho T2* sequence was installed on 1.5 T MRI scanners (GE Healthcare) at six different sites. Five healthy subjects at each site (n = 30) were scanned to verify the homogeneity of normal ranges (T2* lover limit of normal 20 ms). Then, five TM patients were scanned at the reference site and were rescanned locally

Figure 1 (abstract O100)



(n = 25) within one month. T2* images were analysed using a previously validated software (HIPPO MIOT®).
After the assessment of CMR technique reproducibility, patients enrolling started in September 2006. A centralized data management system was made to share patient data between CMR and thalassemia sites. It allowed optimizing the TM patients care and favouring the creation of a clinical-instrumental database with data exchange facilities to develop diagnostic, prognostic and therapeutical evidence-based treatments for thalassemia patients. The study was approved by the local ethics committees and followed the principles outlined in the Declaration of Helsinki.
Results: Global and segmental T2* values of healthy subjects showed inter-sites homogeneity. On TM patients, for global heart T2* values the correlation coefficient was 0.97, Coefficients of Variation (CoVs) ranged from 0.04 to 0.12 and Intraclass Coefficients (ICCs) ranged from 0.94 to 0.99. The mean CoV and ICC for segmental T2* distribution were 0.198 and 88, respectively. Figure 1A shows linear regression of global heart T2* values obtained from 25 (5 × 5) patients who were scanned at the reference site and locally at each of the other five sites on the same conditions.

Since the project's beginning, 695 thalassemia patients have been involved in the network. 630 patients (90%) successfully underwent CMR examination. Twenty patients (3%) refused CMR, mainly due to claustrophobia. The remaining patients (7%) have been scheduled for future examination. The mean distance from the patient home locations to the CMR site where the patients underwent the exams, which is considered an indicator of patient comfort, significantly decreased during the network's evolution. In Figure 1B, the average distances from the thalassemia centers which sent the patients for CMR examination are plotted versus time.
Conclusion: The multislice multiecho T2* technique is transferable among scanners with good reproducibility. The network seems to be a robust and scalable system in which T2* CMR-based cardiac iron overload assessment is available, accessible and reachable for a significant and increasing number of thalassemia patients, reducing the mean distance from the patients' locations to the CMR sites.

O101
3 T cardiac magnetic resonance performs well as the primary scanner in a clinical setting: our initial experience at a tertiary care center

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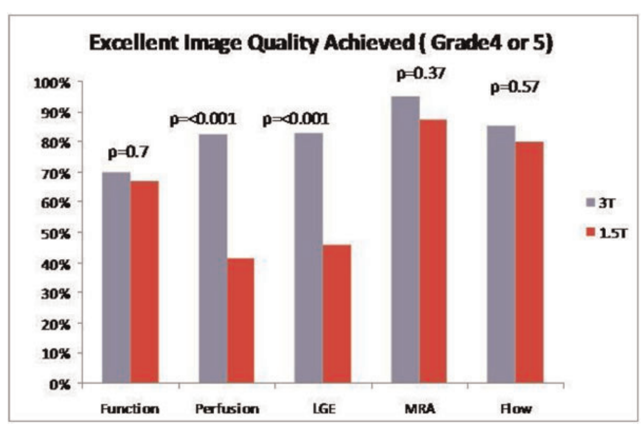
Introduction: Despite the advantage of increased signal-noise-ratio, skepticism exists regarding the use of 3 T as the primary scanner for routine clinical CMR examination due to potential for gating difficulties related to the increased magnetohydrodynamic effect, off-resonance artifacts, and patient heating. We quantified the diagnostic potential and artifacts based on our experience of the first 4 months of routine clinical 3 T CMR exams in a tertiary clinical center.

Purpose: To test the hypothesis that 3 T MRI is practical in serving a busy clinical CMR service as the primary routine cardiac scanner.
Methods: Two-hundred and eighty patients were referred for CMR for a broad range of clinical indications over a 4-month period and underwent a 3 T cardiac MRI scan (MAGNETOM Tim Trio, Siemens, Germany). Three experienced readers quantified total scan time, troubleshooting time for 3 T-related off-resonance artifacts, image quality, and artifacts in all pulse sequences performed. Image quality was graded per accepted criteria (1-Non diagnostic, 2-diagnosis suspected but not established with severe blurring, 3-definite diagnosis despite moderate blurring, 4-definite diagnosis with only mild blurring, 5-definite diagnosis without visible blurring). Artifacts severity was graded in a 5-point scale (1-No artifacts, 2-minimal artifacts, good diagnostic quality images, 3-moderate artifact and diagnosis established, 4-considerable artifacts, diagnosis suspected but not established, 5 – severe artifacts, non diagnostic images). Excellent image quality was classified as a score ≥ 4 and minimal or no artifact was classified as an artifact score of ≤ 2. Forty-six 1.5 T CMR studies performed at the same study period with a matched spread of indications were randomly selected as a control group for comparison.
Results: On average, 2.8 minutes (5% of total scan time) were spent to eliminate off-resonance banding artifacts in 3 T. This time is made up by more aggressive accelerated parallel imaging technique. As a result, average total scan time using 3 T was not different from 1.5 T (54 ± 14 vs. 54 ± 12 minutes, P = 0.47). No patients failed to complete the study due to SAR limit. There were no complications during any of the 1.5 T or 3 T CMR studies. A significantly higher proportion of perfusion images were graded as being of excellent quality on 3 T when compared to 1.5 T (82.4% vs. 41.4%, p < 0.0001) (Figure 1). A significantly higher number of perfusion images also had minimal or no artifact on 3 T when compared to 1.5 T (93.7% vs. 72.4%, p = 0.0016). When LGE images were analyzed, a significantly higher proportion of images on 3 T were graded as being excellent (82.6% vs. 46.2%, p < 0.0001) and the proportion of LGE images having minimal or no artifact was also significantly higher on 3 T (83.0% vs. 56.4%, p = 0.0042). The number of Cine SSFP, pulmonary vein MRA, and phase contrast images that were

Figure 1 (abstract O101)



Excellent image quality achieved (grade 4 or 5).