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Long-term longitudinal prospective CMR study in patients with thalassemia major

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Introduction: According to the International Guidelines, thalassemia major (TM) patients should perform a complete cardiac evaluation, including a CMR scan, every year. However, prospective CMR studies are limited beyond 3 years and longer-term studies are, therefore, important.
Aim: We aimed to determine longitudinal changes in cardiac iron and function assessed by CMR over 6 years in a large cohort of TM patients.
Methods: We considered 426 TM patients (205 males; 30.87±8.21 years) consecutively enrolled in the MIOT (Myocardial Iron Overload in Thalassemia) Network with a CMR follow-up (FU) study at 72 months (6 years).
Myocardial iron overload (MIO) was quantified by the multislice multiecho T2* technique. Biventricular function was quantified by cine images.
Results: Four patterns of MIO were identified: no MIO (all segments with T2*≥20 ms), heterogeneous MIO and global heart T2*≥20 ms, heterogeneous MIO and global heart T2*<20 ms, and homogeneous MIO (all segments with T2*<20 ms). An improvement in cardiac iron levels was detected in the 72% of patients showing MIO at the baseline (at least one pathologic segment) while, globally, a worsening was detected in 40 patients (see Figure).
Biventricular end-diastolic volume indexes (EDVI) were significantly lower at the FU CMR. In patients with significant baseline MIO (global heart T2*<20 ms) a significant decrease in all biventricular volumes and a significant increase in left ventricular ejection fraction (EF) (mean difference: 3.83±8.48%, P<0.0001) as well as in right ventricular EF (mean difference: 1.79±9.04%, P=0.042) were detected with a concordant improvement of MIO status.
The 50.7% of the patients changed the type of chelator during the FU based on CMR results. The percentage of patients who changed the chelation therapy was significantly higher in patients with significant MIO than in patients without MIO (60.2% vs 46.2%; P=0.008).

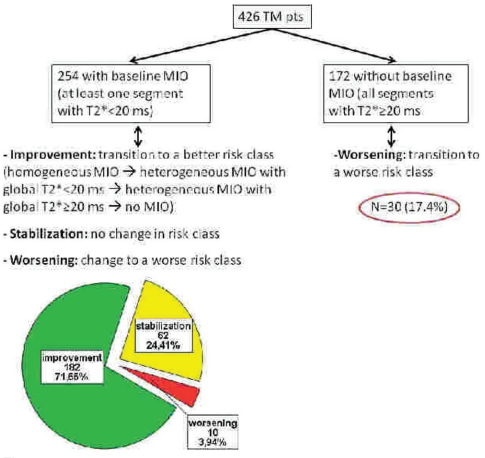

Figure 1

Conclusion: Over a period of 6 years, the continuous monitoring of cardiac iron levels and a tailored chelation therapy allowed an improvement in more than 70% of patients with baseline MIO and a consequent improvement of biventricular function.
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NEW ASPECTS OF HEART FAILURE TREATMENT

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Additional use of SGLT2 inhibitors in the treatment of acute decompensated heart failure may prevent acute kidney injury

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Background: Heart failure is one of the leading causes of hospitalizations in developed country. Concomitant renal dysfunction is common in patients with heart failure. One fourth of patients hospitalized for the treatment of acute decompensated heart failure (ADHF) will experience significant worsening of renal function. Previous reports have demonstrated that worsening of renal function, so acute kidney injury (AKI) is a strong risk factor for long-term outcomes in ADHF patients. Diuretic therapy is valuable in treating congestion but may worsen renal function. Moreover, there is no therapy where efficacy has been established to prevent AKI. In recent papers, SGLT2 inhibitors (SGLT2i) could inhibit the progression of chronic kidney disease. As one of mechanisms, the SGLT2i's effects of suppressing renal tubular injury is consider. Tubular injury is important as a cause of AKI. However, little of known about the efficacy and safety of SGLT2i in patients with ADHF.
Purpose: We aim to evaluated this clinical questions retrospectively.
Methods: We enrolled 31 type2 diabetes patients hospitalized for ADHF in our hospital from Jan to Dec 2017. Exclusion criteria are cases of over 90 years old, end stage of renal failure, clinical scenario 4 or 5, cases with cancer, and those who died of severe infection during hospitalization.
Results: 12 patients received SGLT2 inhibitor. Between the SGLT2i group and conventional group, there is no significantly differences about age, gender difference, BMI, previous history, and concomitant medication at baseline. HbA1c in the SGLT2i group is significantly higher than conventional group (8.1±0.8 vs 7.1±0.8, p<0.01). Administration with SGLT2i was initiated early with median 13 hours after hospitalization. Indices of diuretic effects such as urine volume or body weight loss did not differ significantly between two groups. On the other hands, dose of diuretics was significantly decreased in SGLT2i group (furosemide dose 33±4 vs 13±5 p<0.01). Moreover a higher percentage of patients in conventional group than in SGLT2i group had AKI (conventional 58% vs SGLT2i 16%, p=0.03).
Conclusion: In single center retrospective study involving DM patients hospitalized for ADHF, the use of SGLT2i was superior to conventional therapy for the prevention of AKI.

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Full combination of guideline-recommended medical therapy is associated with better long-term mortality in acute heart failure patients with low blood pressure and renal dysfunction

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Introduction: Aggregating evidence reveals that guideline-recommended medical therapy (GRMT) including beta-blocker (BB), angiotensin-converting enzyme inhibitor or angiotensin II receptor blocker (ACEi/ARB), and mineralocorticoid-receptor antagonist (MRA) improves mortality in heart failure patients with reduced left ventricular ejection fraction (LVEF). However, low blood pressure (BP) and impaired renal function often hinder the induction of GRMT in acute heart failure (AHF) patients, although this population is at high risk for adverse clinical events.
Purpose: We aimed to determine whether GRMT affects mortality in AHF patients with low BP and advanced renal dysfunction at discharge.
Methods: This study initially included 1,286 consecutive patients who were urgently hospitalized due to AHF and discharged alive. After the exclusion of patients with regular hemodialysis, patients with preserved LVEF (>40%), patients with systolic BP >100 mmHg at discharge and patients with estimated glomerular filtration ratio (eGFR) >45 mL/min/1.73m^2, 112 AHF patients with reduced LVEF (<50%) and renal dysfunction (>grade 3b) presenting low BP (<100 mmHg) at discharge were ultimately enrolled in this study. Of them, 68 patients who received full medications including BB, ACEi/ARB and MRA (full-GRMT group), and 44 patients who received 1–2 medications among GRMT (partial-GRMT group) were respectively compared. The primary endpoint of this study was all-cause mortality.
Results: During observational period, 22 deaths (20%) were observed. Kaplan-Meier analysis showed that full-GRMT group had significantly lower all-cause mortality than partial-GRMT group (Log-rank, p=0.011, Figure). After adjustment for age, gender and BNP level at admission by Cox proportional hazards analysis, the hazard ratio (HR) for all-cause mortality was significantly lower in full-GRMT patients compared to partial-GRMT patients (HR 0.26, 95% confidence interval 0.07–0.90, P=0.033).

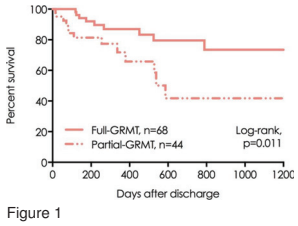

Figure 1

Conclusions: Full medications of GRMT at discharge had better long-term mortality than partial administration of GRMT in AHF patients with reduced LVEF, even they had advanced renal dysfunction and low BP at discharge.