

EFFICACY OF ORAL IRON REPLACEMENT THERAPY IN PEDIATRIC PATIENTS WITH HEART FAILURE

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Background: Iron deficiency (ID) is associated with worse outcomes in children with systolic heart failure (HF). Oral iron replacement therapy (IRT) is first-line therapy for ID in children but the efficacy of oral IRT in children with HF is unknown. We hypothesized that oral IRT would be ineffective in replenishing iron stores in >50% of children with HF.

Materials/Methods: We performed a single center retrospective cohort study of patients aged ≤ 21 yrs with systolic HF and ID who received oral IRT (2-5mg/kg/day) between 01/2017 and 12/2018. ID was defined as >2 of the following: serum iron <50 mcg/dL, serum ferritin <20 ng/mL, transferrin >300 ng/mL, transferrin saturation $<15\%$. Iron studies and hematologic indices pre and post IRT were compared in patients who received ≥ 6 weeks of therapy (to allow adequate duration of IRT to assess response) using paired-samples Wilcoxon test.

Results: Forty-two independent courses of oral IRT (in 40 patients) met inclusion criteria. The cohort was 52% male with median age 13yrs (IQR 5 – 16yrs). HF etiologies included cardiomyopathy (57%), congenital heart disease (31%), and history of heart transplantation with graft dysfunction (12%). Pre-IRT, the median hemoglobin was 10.7 g/dL (IQR 9.4 – 12.6 g/dL), 26% (11/42) had microcytosis, and 57% (24/42) had elevated RDW. Patients received ferrous sulfate (40/42) or ferrous gluconate (2/42). Median duration of oral IRT was 68d (IQR 32 – 145d). Twenty-nine patients received ≥ 6 weeks of IRT and were included for the analysis for response to oral IRT. Post-IRT iron testing was available in 18 patients. Post-IRT, 50% (9/18) of the patients remained iron deficient. Serum iron studies showed some improvement between pre- and post-IRT: median iron levels improved from 38 (27 – 47) mcg/dL to 63 (39 – 106) mcg/dL ($p = 0.002$), ferritin improved from 22 (10 – 75) ng/mL to 43 (13 – 125) ng/mL ($p = 0.047$), and transferrin saturation improved from 9% (6% – 12%) to 15% (9% – 29%), $p = 0.002$. However there was no improvement in transferrin levels, from 315 (271 – 357) mg/dL to 296 (256 – 359) mg/dL ($p = 0.451$). The haemoglobin improved from 10.7 (9.2 – 12.6) g/dL to 12.7 (11.4 – 13.5) g/dL ($p = 0.036$).

Conclusions: This is the first report about oral IRT in children with HF. Though median values of individual iron parameters increased post oral IRT, half of the children with HF did not respond to oral IRT and remained iron deficient. Further studies are needed to find the most suitable IRT for children with HF.