

Evaluation of the effect of severe anemia by speckle tracking echocardiography on cardiac function pre and after treatment

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Objectives: Anemia is an independent risk factor for poor outcome in chronic heart failure, but its role in heart failure with normal EF (HFNEF) remains unclear. We aimed to examine the effect of correction of iron and vitamin b-12 deficiency on cardiac mechanics in children with anemia.

Methods: We studied 38 children with severe anemia (hemoglobin levels < % 8 gr/dl) with normal ejection fraction (median age 5.2 years; 6 months - 17 years). The control group comprised age- and sex- matched 30 healthy children (median age 5.7 years; 5 months - 17 years). Children with anemia evaluated using echocardiography basally and after correction of the anemia with oral iron and vitamin b-12 supplements. Cardiac functions were assessed by using conventional echocardiography, tissue Doppler imaging (TDI) and two dimensional speckle tracking echocardiography (2DSTE).

Results: The mean hemoglobin concentration of patients was 6.3 ± 1.2 gr/dl. Of 38 children with anemia, 30 patients had iron deficiency anemia, 4 patients had vitamin b-12 deficiency anemia and 4 patients had iron and vitamin b-12 deficiency. After iron and vitamin b-12 supplementation, the mean hemoglobin concentration was 11.8 ± 1.3 gr/dl. Initial the left ventricle global and regional longitudinal strain and strain rate values were significantly lower in patients compared with after treatment of patients and healthy children, while circumferential and radial strain and strain rate did not differ among groups. Supplementation with iron and vitamin b-12 longitudinal strain and strain rate values improved significantly in patients.

Conclusion: Our results suggest that left ventricle longitudinal myocardial deformation is decreased in children with severe anemia. Supplementation with iron and vitamin b-12 results in a significant increase in longitudinal strain comparable with before treatment in children with anemia.