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LETTER TO THE EDITOR

Prediction of Heart Complications in Thalassemia Major Patients

Dear Editor,

Beta thalassemia major is a chronic hemolytic anemia because of abnormal hemoglobin synthesis. These patients are at risk for iron overload and tissue intoxication. Heart failure is the most common and the leading cause of mortality in these patients. Heart complications could be prevented or attenuated with frequent transfusions and deferoxamine administration as a specific iron chelator.[1-4,8] Beta thalassemia major is one of the most common anemia in the south of Iran.[1-3] In this study, we tried to describe the predictors of heart complications in patients with beta thalassemia major.

The study was conducted at Thalassemia Research Center of Ahvaz Jondishapour University of Medical Sciences. We enrolled all patients with clinical and electrophoresis criteria of beta thalassemia major who were older than 5 years. The patients with congenital heart diseases were excluded. Serum ferritin and hemoglobin (Hb) were measured in all patients. In all patients, chest X ray (CXR) and echocardiography were performed. Left ventricular systolic dysfunction was considered as ejection fraction ≤ 50%. The patients were divided into 3 groups according to their serum ferritin: serum ferritin <2500 ngr/ml (group one), serum ferritin of 2500-5000 ngr/ml (group two) and serum ferritin >5000 ngr/ml (group three).

There were 155 patients who were eligible for the study. Thirty-five patients were reluctant to perform echocardiography. Fifty-seven (47.5%) patients were male and 63 (52.5%) were female. The mean age of the patients was 16.6±6 years. The mean serum ferritin was 4285.17±2341.24 ng/ml and the mean Hb was 9.04±0.76 gr/dl. Heart failure was not diagnosed in patients by clinical examination. CXR was abnormal in 32 patients (26.4%). Echocardiography showed that 15 (12.5%) patients had hypokinesis of the left ventricle wall. Ejection fraction was <50% in 6 patients (5%). Mean ejection fraction decreased by increasing serum ferritine, but the difference was not significant.

The patients with beta thalassemia major have chronic hemolysis and need frequent transfusions which lead to iron overload and tissue intoxication. In this study, we tried to find echocardiographic evidence for heart complications in patients with beta thalassemia major and its relationship with ferritin level. There were no patients with clinical heart failure and only 5% of our patients had echocardiographic findings of the left ventricular dysfunction. No relationship was found between serum ferritin and left ventricular dysfunction. One study showed that electrocardiography and CXR were not sensitive diagnostic methods in detecting the early stages of cardiac abnormalities.[5] One study in Italy showed a relationship between serum ferritin and left ventricular ejection fraction.[6] Another survey which was done on 44 patients with major beta thalassemia showed no relationship between left ventricular diastolic function and serum ferritin.[7] In another study, systolic dysfunction was seen in 28 patients (33.3%) with a mean age of 20.1±5.5 years. The patients who suffered from left ventricular systolic dysfunction had not only a higher mean age but also their mean age for the beginning of Deferoxamine and transfusion was higher. These results confirm the benefits of hypertransfusions and regular taking of deferoxamine in prevention of heart complications.[9]

The results of our study suggest that echocardiography have poor diagnostic value in early detection of heart complications of patients with major beta thalassemia.

Keywords: Heart; Complications; Thalassemia major; Iran

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References

1 Zamani J. Heart complications in patients with major thallasemia. Dar haghshenas M, Zamani J. Thallasemia, Shiraz Medical Sciences University press; 1997: p.87-100.

2 Malekpour H. Epidemiology of thallasemia. Dar haghshenas M, Zamain J. Thallasemia, Shiraz Medical Sciences University press; 1997: p. 2-14.

3 Rabani A, Azarkayvan A, Farhadi Langeroudi M, Korosedri GhH. Clinical evaluation of 413 thallasemic patients. *Tehran University Medical Journal (TUMJ)* 2000; **58**:35-41.

4 Bosi G, Crepaz R, Gamberini MR, Fortini M, Scarcia S, Bonsante E, Pitscheider W, Vaccari M. Left ventricular remodelling, and systolic and diastolic function in young adults with beta thalassaemia major: a Doppler echocardiographic assessment and correlation with haematological data. *Heart* 2003;**89**:762-6. [12807852] [doi:10.1136/heart.89.7.762]

5 Aessopos A, Farmakis D, Hatziliami A, Fragodimitri C, Karabatsos F, Joussef J, Mitilineou E, Diamanti-Kandaraki E, Meletis J, Karagiorga M. Cardiac status in well-treated patients with thalassemia major. *Eur J Haematol* 2004;**73**:359-66. [15458515] [doi:10.1111/j.1600-0609.2004.00304.x]

6 Naseh A, Taghavi S. Prevalence of heart complications in major beta thallasemia. Pediatric Residentship Mashad Medical Faculty. 2002.

7 Ghaemian A, Hoseini A, Kosarian M. Left ventricular diastolic abnormalities in beta thallasemia major with normal systolic function. *MJIRI* 2002;**16**:9-12.

8 Behrman Richard E MD, Kligman Robert M, Jenson Hal B. Nelson text book of pediatric. 16th edition, Philadelphia, Pensylvania 19106.WB Saunders company; 2000: p. 1484-7.

9 Jessup M, Manno CS. Diagnosis and management of iron-induced heart disease in Cooley's anemia. *Ann N Y Acad Sci* 1998;**850**:242-50. [9668546] [doi:10.1111/j.1749-6632.1998.tb10481.x]