ANTIOXIDANT STATUS IN THALASSEMIC PATIENTS

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Abstract

Background: increased membrane lipid peroxidation in patients with thalassemia has been reported suggesting that superoxide radicals generated in excess following auto-oxidation of isolated hemoglobin chains is an important contributor to the hemolytic process.

Objective: This study was undertaken to evaluate the extent of lipid peroxidation and antioxidant status of patients with beta-thalassemia in comparison to healthy people.

Methods: Red cell superoxide dismutase (SOD) activity and red cell catalase activity were measured in the biochemistry department for the period from January 2003 to October 2003, 76 patients with beta-thalassemia, 14 patients with beta-thalassemia minor and 19 healthy controls were studied.

Results: Erythrocytes of patients with beta-thalassemia major had significantly higher SOD than control ($p<0.0004$). Red cell catalase activity of thalassemia minor patients was significantly higher than that of the control ($p<0.05$). In thalassemic patients, the more anemic patients have significantly higher SOD activity, but this correlation was not present between anaemic patients & catalase activity.

Conclusion: Red cell superoxide dismutase activity was greatly increased in homozygous beta-thalassemia, and inversely correlated with severity of anaemia.

Keyword: SOD, Catalase, Thalassemia.

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Introduction

Auto-oxidation of biomembranes is considered to be the primary factor involved in cellular senescence and breakdown[1,2]. An increased production of highly activated forms of oxygen released during the oxidation of hemoglobin to methemoglobin in thalassemic red blood cells (RBC)[3-8] has stimulated much interest in superoxide dismutase (SOD) and cellular antioxidant for the control of such deleterious radical reactions. The aim of this study was to evaluate the extent of lipid peroxidation and antioxidant status of patients with beta-thalassemia in comparison to healthy people. Also to find any correlations between the level of these antioxidants with the appropriate time of transfusion.

Patients & Methods

During the period of ten months from January 2003 to October 2003, 109 subjects were included in this study; 76 patients with beta-thalassemia major, 14 patients with beta-thalassemia minor were taken from hematology center of Ibn-Balady Hospital, and 19 healthy controls were taken from laboratory healthy staff in Al-Kadhimiya Teaching Hospital.

Venous blood was collected from patients before blood transfusion and then hematological studies were done including; red cell count , white cell count , mean corpuscular volume and haematocrit were determined in a coulter counter ,MS9. haemoglobin concentrations were measured on a haemoglobinometer. Haemoglobin types and quantitation of different types

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