ATTENUATION OF OXIDATIVE STRESS-INDUCED CHANGES IN THALASSEMIC ERYTHROCYTES BY VITAMIN E

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The oxidative stress status of the transfusion-dependant Ëβ- and ß-thalassemia patients were studied before and after treatment with vitamin E for a period of four weeks. The level of cellular vitamin antioxidants viz. ascorbic acid and vitamin E in the thalassemia patients were found to be considerably lower compared to normal subjects. The activities of enzymatic antioxidants viz. catalase, glutathione peroxidase and glutathione reductase were found to be drastically reduced in untreated Ëβ- and ß-thalassemic patients when compared to normal subjects. However, the activity of superoxide dismutase was found to be increased in both types of untreated thalassemic patients when compared to normal individuals. An increase in superoxide dismutase and a decrease in catalase activity reflects the presence of a severe oxidative stress situation in the erythrocytes of the untreated transfusion dependent Ëβ- and ß-thalassemia patients. Changes in erythrocyte membrane protein pattern in untreated Ëβ- and ß-thalassemia patients when compared to normal erythrocyte further confirm the presence of continued oxidative stress in the ailing thalassemic erythrocytes. All these changes in the antioxidant status as well as the changes in the erythrocyte membrane proteins are ameliorated to considerable extent when the transfusion-dependent Ëβ- and ß-thalassemia patients were treated with vitamin E at a dose of 10 mg/kg/day for a period of four weeks. The patients during the treatment period did not exhibit any side effects and gained in body weight indicating a healthy status. The present study reveals that the lipophilic antioxidant vitamin E could be useful in the management of transfusion-dependant Ëβ- and ß-thalassemia patients.

Key words: thalassemia, erythrocyte, oxidative stress, antioxidant defense, antioxidant, vitamin E