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Serum Superoxide dismutase activity in thalassemia patients and healthy subjects with new method

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Serum Superoxide dismutase activity in thalassemia patients and healthy subjects with new method. 1 Elham ghahramanlu, 2Abdollah Banihashem, 3Shima tavallaei, 4Vahid salmasi,5Majid Ghayour mobarhan 1 Blood transfusion organization,north khorasan,Iran. 2 Hematology division, Sheikh Hospital, Faculty of Medicine, MUMS, Mashhad, Iran. 3 Buali Reasearch,Mashhad, Iran. 4 Blood transfusion organization,north khorasan,Iran. 5 Biochemistry and Nutrition Research Center and Department of Nutrition, Faculty of Medicine,Cardiovascular research center,MUMS, Mashhad, Iran. Aim: The aim of this study was to evaluate the extent of status of SOD(an antioxidant enzyme) in β-thalassemia major patients with new method.. Introduction: Superoxide dismutase (SOD) is an enzyme that neutralises molecules of superoxide,a common and extremely destructive free radical. Thalassemic patients (TM) may lead to peroxidative tissue injury by secondary iron overload. In TM patients oxidative stress caused by precipitation of excess alpha-globin chains, iron decompartimentalization, and release of free iron. To combat this potential danger, most cells make superoxide dismutase . Material and method: thalassemic patients age between 7-22 years admitted in Dr.Sheikh Hospital in Mashhad, Iran. 60 thalassemic patients (25 males and 35 females) and 60 normal healthy age and sex matched, were enrolled in the study.SOD activity was measured by using microassay based on the inhibition of pyrogallol oxidation. In order to assess the SOD activity, we used a 96-well-plate microassay based on the inhibition of pyrogallol oxidation.Current assays are indirect, and most of them involve a competition between SOD and an indicator substance for superoxide radical. Result: Serum levels of SOD activities were significantly higher in the patients with beta thalassaemia than in the normal subjects(1.0277±0.144 vs 0.9816±0.131)& (P<0.0001) . Conclusion: The increased superoxide dismutase activity in thalassemia is a response to superoxide generated in greater amounts .When acclimating to increased levels of oxidative stress,SOD concentrations typically increase with the degree of stress conditions. Our study results suggest that iron overload causes peroxidative damage in β-thalassemia and antioxidant systems try to lower tissue damage. our 96-well-plate format assay has the advantages that it is simple, rapid, and high throughput and we suggested it.

Keywords: superoxid dismotase,assay method,thalassemia,serum

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