Chelation Therapy with Desferrioxamine does not Normalize Ferritin Level but Attenuates Oxidative Damage and Improves Total Antioxidant Level in Malaysian Chinese beta-thalassaemia Major Patients

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Abstract

Beta-thalassaemia major causes severe anaemia and patients with it may be transfusion-dependent for life. Regular blood transfusions cause iron-overload that leads to oxidative damage which can hasten mortality. The objective of this research was to study the oxidant-antioxidant indices in beta-thalassaemia major patients at the University of Malaya Medical Centre (UMMC) who were on desferrioxamine-chelation or without chelation therapy. Blood was collected from 39 Chinese patients and 20 controls. Plasma and peripheral blood mononuclear cell lysates (PBMC) were extracted and biochemical tests to evaluate oxidative stress were performed. Oxidative stress was evident in these patients as advanced oxidized protein products (AOPP) and lipid hydroperoxides were elevated, whereas glutathione peroxidase activity and the ferric reducing antioxidant power (FRAP) were reduced. The catalase activity in the patients’ PBMC was elevated, possibly as a compensatory mechanism for the reduced glutathione peroxidase activity in both red blood cells and PBMC. The lower FRAP and higher AOPP levels in the non-chelated patients compared with the chelated patients were indicative of a lower oxidative stress level in the chelated patients. The ferritin levels in the chelated and non-chelated patients were high and the mean levels of liver enzyme activities in the majority of patients were elevated regardless of chelation therapy. In conclusion, this study indicates that desferrioxamine chelation therapy does not normalize ferritin level but attenuates oxidative damage and improves total antioxidant level in Malaysian Chinese beta-thalassaemia major patients.

Keywords

Author Keywords: Beta-thalassaemia major; desferrioxamine; Malaysian Chinese; non-chelated; oxidative stress

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