

Increased relative lymphocyte number with reduced mature activated T-lymphocytes (CD3+CD69+) in stunted iron overloaded major beta-thalassemia patients

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Abstract

Alteration of immune response as either the consequence or cause of growth retardation is one of the common complication found in major beta-thalassemia patients, which may lead them to be susceptible to infection. T-lymphocytes harboring CD69 following their activation are central elements of the immune system. A cross-sectional analytical study applying multicolor flowcytometry aimed to characterize T-lymphocytes surface protein of asymptomatic 51 pediatric major beta-thalassemia patients routinely visit Hasan Sadikin General Hospital for routine blood transfusion linked to their growth status, iron level, and hematology profile were done. Nutritional status was assessed by height-for-age z-score. Serum iron, total iron-binding capacity (TIBC), serum transferrin, and serum ferritin were measured. Hemoglobin concentration, mean corpuscular volume, mean corpuscular hemoglobin and mean corpuscular hemoglobin concentration were also measured. Respectively, 41% and 22% of the population showed stunted and severely stunted growth. Stunted major beta-thalassemia patients showed a significant higher differential count of lymphocyte ($p = 0.02$) than well-nourished patients. Compared to well-nourished major beta-thalassemia patients, significant reduced CD3+CD69+ T-lymphocyte population ($p = 0.04$) while higher TIBC level ($p < 0.0001$) were found. However, TIBC level of stunted major beta-thalassemia patients was significantly lower ($p < 0.0001$) than in severely stunted patients. In conclusion, a chronic inflammatory disorder accompanied with cellular immunological defect revealed in undernourished besides double burdened by iron overload is a serious health problem in major beta-thalassemia patients and this preliminary study makes it even more pronounced. Further investigation in characterizing the T-lymphocyte subsets and cytokines involved in malnourished major beta-thalassemia patients is imperative to be carried out.

Keywords: Thalassemia major; T-lymphocyte; CD3+CD69+; stunting

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