

Evaluation of iron overload between age groups using magnetic resonance imaging and its correlation with iron profile in transfusion dependent thalassemia

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Abstrak

ABSTRACT

Background: routine blood transfusion in transfusion-dependent-thalassemia (TDT) causes iron accumulation in various organ. Serum markers of iron overload, serum ferritin and transferrin saturation, are sensitive but not specific. MRI T2-star (T2*) is valuable for detecting iron level in organs. This study aimed to explore the degree of iron overload in various organs, iron deposition difference between children and adults, also its correlation with serum marker of iron overload. Methods: this was a cross-sectional study of TDT patients who had been evaluated by MRI T2* examination in Cipto Mangunkusumo Hospital from 2014 to 2018. Results: a total of 546 subjects was included in this study. The number of subjects between children and adults was almost equal. Most of subjects had normal cardiac iron deposition. The difference of cardiac iron overload between children and adults was significant ($p=0.009$). Liver evaluation showed that most of subjects had moderate to severe iron overload. This difference between children and adults was significant ($p=0.017$). Pancreas evaluation showed that either children or adults mostly had mild pancreatic iron overload. Analysis of T2* showed that pancreatic iron deposition progressed with increasing age. Serum ferritin had weak correlation with heart T2* MRI, moderate correlation with pancreas and liver T2* MRI. Relationship between transferrin saturation and T2* MRI was extremely weak. Conclusion: cardiac and hepatic iron deposition between children and adults differ significantly. Liver has the greatest iron overload, followed by pancreas and heart. Iron deposition in liver and pancreas has been started from earlier age. Pancreatic iron deposition rises with increasing age. Serum ferritin and transferrin saturation should not be used solely to predict iron overload in various organs. We suggest that MRI evaluation must be conducted at least once to assess iron deposition in organs.