frontiers in Pediatrics

ORIGINAL RESEARCH
published: 22 November 2021
doi: 10.3389/fped.2021.754813

Occult Kidney Dysfunction in Children With Transfusion-Dependent Thalassemia

*Nurwahida Mohd Zikre[1], Nor A. Muhamad[2], Caroline S. Y. Eng[3], Nur E. Zailanalhuddin[3], Charles D. Lai[1], Jen C. Foo[1], Suet L. Yap[3], Hany Ariffin[1] and Karmila Abu Bakar[1]**

[1] Paediatric Unit, Faculty of Medicine, University Malaya, Kuala Lumpur, Malaysia, [2] Sector for Evidence-Based Healthcare, National Institutes of Health, Ministry of Health, Kuala Lumpur, Malaysia, [3] Paediatric Unit, Hospital Tuanku Ja'afar, Seremban, Malaysia

Background: Thalassemia is the commonest hemoglobinopathy in Southeast Asia. Kidney dysfunction is an underreported sequelae in children with thalassemia. We conducted a retrospective study to identify the prevalence of and predisposing factors for kidney dysfunction in children with transfusion-dependent thalassemia (TDT).

Method: Abnormal kidney function was defined as children with a glomerular filtration rate (GFR) of <90 ml/min/1.73 m^2 or a decline in GFR of >20 ml/min/1.73 m^2 or presence of nephrotic range proteinuria within 3 years of commencing regular (every ≤6 weeks) red cell transfusion. Data analyzed were age at diagnosis of thalassemia, number of transfusion-years, iron chelation therapy, serum ferritin, and pre-transfusion hemoglobin levels.

Results: Eighty-one children were studied. Mean age was 11.72 ± 5.275 years. Thirty out of 81 (37%) demonstrated abnormal kidney function. Evidence of glomerular hyperfiltration was seen in 29/81 patients (25.85%) at their last clinic visit. This fraction was doubled [48/81 (59.3%)] when the cohort was tracked back by 3 years from the last clinic encounter. Age at diagnosis (RR, 1.157; 95% CI, 1.014–1.319; $p = 0.03$) and duration of receiving transfusions (RR, 0.984; 95% CI, 0.974–0.994; $p = 0.001$) were associated with increased risk of developing abnormal kidney function.

Conclusion: Abnormal kidney function in children with TDT may be overlooked by medical personnel without active screening measures. Children receiving regular red cell transfusions require systematic surveillance to enable early detection of kidney dysfunction and timely implementation of appropriate therapeutic interventions.

Keywords: thalassemia, nephropathy, transfusion-dependent, ferritin, iron chelator

OPEN ACCESS

Edited by:
Carmen M. Halabi, Washington University School of Medicine in St. Louis, United States

Reviewed by:
Kevin T. Barton, Washington University School of Medicine in St. Louis, United States
Mohsen Saleh Elalfy, Ain Sham University, Egypt

***Correspondence:**
Karmila Abu Bakar
karmila@um.edu.my

Specialty section:
This article was submitted to Pediatric Nephrology, a section of the journal Frontiers in Pediatrics

Received: *07 August 2021*
Accepted: *04 October 2021*
Published: *22 November 2021*

Citation:
Mohd Zikre N, Muhamad NA, Eng CSY, Zailanalhuddin NE, Lai CD, Foo JC, Yap SL, Ariffin H and Abu Bakar K (2021) Occult Kidney Dysfunction in Children With Transfusion-Dependent Thalassemia. Front. Pediatr. 9:754813. doi: 10.3389/fped.2021.754813

INTRODUCTION

Thalassemia is the commonest inherited hemoglobinopathy, causing premature rupture of the red blood cells and ineffective erythropoiesis. It is estimated that about 8,000 people in Malaysia are living with thalassemia, with more than half (57%) of them dependent on regular blood transfusions (1).

In the absence of hematopoietic stem cell transplantation, red cell transfusion remains the mainstay of treatment in patients with transfusion-dependent thalassemia (TDT). Children with