



Effects of Nutritional Status on Academic Achievement among Children with Thalassemia at Phramongkutklao Hospital

Panchalee Poovichayasumlit¹, Wilaiporn Chanpreecha², Chanchai Traivaree¹, Chalinee Monsereenusorn¹, Apichat Photi-a¹,

Nawachai Lertvivatpong¹, Piya Rujkijyanont¹

¹Division of Hematology-Oncology, Department of Pediatrics, Phramongkutklao Hospital and College of Medicine, Bangkok, Thailand.

²Division of Nutrition, Department of Pediatrics, Phramongkutklao Hospital and College of Medicine, Bangkok, Thailand.

Introduction

- Thalassemia is a chronic hematologic disease that causes chronic anemia with varying of severity.
- Children with thalassemia may have malnutrition and cognitive function impairment.
- This study aimed to investigate the effect of nutritional status on academic performance among children with thalassemia at Phramongkutklao Hospital.

Methods

- This cross-sectional study was performed among 47 patients aged 7-18 years old. Patients with other genetic disorders that affect growth and cognitive function was excluded.
- Growth parameters and basic laboratory data were collected.
- Questionnaires were used to assess additional associated factors such as academic performance, nutritional intakes, physical activity, and sleep schedule.
- Nutritional status was evaluated using World Health Organization classification (WHO classification).
- Association between categorical variables, such as nutritional status and academic performance was done using a Chi-square test with statistically significant at p -value <0.05
- Multivariable analysis was used to identify associated factors with malnutrition

References

- Ayukarningsih Y, Amalia J, Nurfarhah G. Thalassemia and nutritional status in children. *Journal of Health and Dental Sciences*. 2022;2(1):39-52.
- Gamayani U, Lestari N, Ganiem AR, Panigoro R. Influence of Working Memory on Academic Achievement and Quality of Life in Children with Beta-Thalassemia Major. *The Open Psychology Journal*. 2019;12:76-83.
- El-Alameey IR, Alzaree F, Shehata MA, Shady MMA, Atti MA, El-Khoneyzy MI. Neurocognitive Function and Its Related Potentials in Children with Beta Thalassemia Major: An Egyptian Study. *Open Access Maced J Med Sci*. 2019;7(3):322-8.

Results

- Among 47 patients, 35 was transfusion-dependent thalassemia (TDT) and 12 was non-transfusion-dependent thalassemia (NTDT).
- 30 (64%) were male and 17 (36%) were female. The median age at diagnosis was 18 months.
- The prevalence of malnutrition by WHO classification was 55.3% (57.1% in TDT and 50% in NTDT).
- Percent height-for-age (%HA) in malnutrition group was significantly lower than normal group (92.0 ± 5.4 and 98.9 ± 3.3 respectively).
- In addition, grade point average (GPA) in malnutrition group was significantly lower than normal group (2.9 ± 0.6 and 3.5 ± 0.5 respectively).
- Parent income was significantly lower in malnutrition group
- According to multivariate analysis, GPA was a significant associated factor for malnutrition ($p = 0.027$).

Associated factor for malnutrition

Parameters	Normal (n=21)	Malnutrition (n=26)	p-value
Grade point average (GPA) , Mean $\pm$ SD	3.5 $\pm$ 0.5	2.9 $\pm$ 0.6	0.002
Age (year), Mean $\pm$ SD	12.3 $\pm$ 3.8	12.7 $\pm$ 2.5	0.743
Age at diagnosis (month), Median (IQR)	18 (9 - 48)	17 (8 - 35)	0.466
Sex, n (%)			0.391
Male	12 (40)	18 (60)	
Female	9 (52.9)	8 (47.1)	
Type, n (%)			0.668
TDT	15 (42.9)	20 (57.1)	
NTDT	6 (50)	6 (50)	
BMI	17.5 $\pm$ 2.0	17.6 $\pm$ 4.2	0.941
Percent height-for-age (%HA)	98.9 $\pm$ 3.3	92.0 $\pm$ 5.4	<0.001
Pretransfusion Hb level (gm/dl), Mean $\pm$ SD	8.7 $\pm$ 0.9	8.4 $\pm$ 1.1	0.250
Serum ferritin, Median (IQR)	736 (187.5 - 1136.5)	980 (486 - 1388)	0.178
Iron chelating therapy			0.142
Yes	11 (36.7)	19 (63.3)	
No	10 (58.8)	7 (41.2)	
Family income (Thai baht), Median (IQR)	35,000 (30,000 - 50,000)	30,000 (15,000 - 40,000)	0.039
Exercise 1 hours, 3days/ week, n (%)			0.999
No	17 (44.7)	21 (55.3)	
Yes	4 (44.4)	5 (55.6)	
Hours of sleep, n (%)			0.900
<8 hours	6 (46.2)	7 (53.8)	
$\geq$ 8 hours	15 (44.1)	19 (55.9)	

Conclusion

- Malnutrition is common in thalassemia especially in TDT and have significant effect on academic achievement.
- Exploration of financial situation and providing appropriate supports on the patients might decrease the burden of malnutrition.
- Regular assessment of nutritional status among those patients are warranted.

