Relationship between Hb F Level and Requirement of Blood Transfusion in β-thalassemia Disease

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Background: Thalassemia is a common hereditary hematologic disorder in Thailand. Approximately 20%-30% of population has α-thalassemia mutations, while 3%-9% has β-thalassemia (β-thal) mutations. Thalassemia has a variation of clinical severity depending on several factors resulting in different severity from mild to severe anemia requiring regular blood transfusion. Some of thalassemia patients (pts) have very serious complications and die shortly from those events. Fetal Hemoglobin (HbF) is the hemoglobin with the major role when human is still a fetus and later normally switch-off soon after birth in normal population. HbF is higher in β-thal patients and affects the clinical severity in these patients. Some evidences indicate that increasing in HbF levels results in a less severity.

Objective: To evaluate relationship between HbF level and requirement of Blood transfusion in patients with β-thal diseases.

Methods: We conducted a prospective cohort study in patients diagnosed with β-thal with known Hb typing who visited Hematology clinic between July 2014 and December 2017. Primary outcome was relationship between HbF level and requirement of blood transfusion. Secondary outcome was amount and duration of blood transfusion. Chi-square test and Kruskal-Wallis test were used for primary outcome, while multinominal logistic regression was applied for secondary outcome analysis.

Results: A total of 130 patients were included. Average age of patients was 26.77 ± 10.88 years. Major clinical features were jaundice (95.3%), hepatosplenomegaly (96.9%), and iron overload (43%), with average Hb = 8.1 ± 1.4 mg/dL. Approximately, 72.3% of patients regularly received folate treatment, while 26.2% of the entire cohort never received blood transfusion. HbF level was inversely correlated to iron overload, folate therapy, amount and duration of blood transfusion, with statistically significant (p-values of 0.024, 0.001, and <0.001, respectively). When using univariate analysis to analyze correlation of HbF level with several outcomes, it was found that the significantly affected factors were iron overload, amount of blood transfusion, and duration of blood transfusion with odd ratios of 0.24, 0.03, and 0.03, respectively.

Conclusion: β-thal patients with high HbF level require less transfusion than low HbF level. Additionally, β thalassemia patients with high HbF level have less iron overload than low HbF level.

Keywords: β–thalassemia diseases, HbF level, Blood transfusion