Malaysian Society of Haematology

17TH MSH SCIENTIFIC MEETING
2-4 April 2020 | Shangri-La Hotel KUALA LUMPUR

ABSTRACT SHARING
www.mshmeeting2020.com

THE UNIQUE BETA ZERO SOUTH EAST ASIA DELETION (β°)-THAL SEA;β°-THALASSAEMIA OR HEREDITARY PERSISTENT FETAL HAEMOGLOBIN (HPFH)?

Norafiza Mohd Yasin et al
Haematology Unit, Cancer Research Centre, Institute for Medical Research, Kuala Lumpur, Malaysia

Background

We report hematological parameters and molecular characterization of beta zero (β°) South East Asia (SEA) deletion with unusually high levels of Hb F as compared to a classical beta-thalassemia trait.

Materials and Methods

Retrospective analysis of 303 cases presented with high Hb F level (>5%) based on hemoglobin analysis were done to exclude Hereditary Persistent Fetal Haemoglobin (HPFH) and Delta-Beta Thalassemia (δβ) by GAP-PCR. Seventeen cases were positive for the β° - SEA deletion. The mutation was analysed and the results were compared between another beta zero thalassaemia group (β° -FIL, β° -IVS1-1,β° -3.5kb, Codon41/42), δβ (THAI) and HPFH group (HPFH-6 and Siriraj).

Results

Among 303 samples investigated, 228 (75.2%) were heterozygous, 22 (7.3%) were homozygous and 53 (17.5%) of them were found to be co-inherited with different types of β-thalassemia mutations. Of these 228 heterozygous cases, βº-thalassemia mutations were identified in 148 (64.9%); 69 (46.6%) with Filipino deletion, 39 (26.4%) with Codon 41/42 mutation, 16 (10.8%) with IVS1-1 mutation, 15 (10.1%) with SEA deletion and 9 (6.1%) with 3.5Kb deletion. The demographic data including state and ethnicity of βº-SEA deletion cases were analysed. The results showed that βº-SEA deletion was frequently received from Sarawak with n= 5 (29.4%), followed by Sabah with 3 (17.6%) and Selangor with 3 (17.6%). Overall, Chinese had the highest number of βº-SEA deletion cases with n=10 (58.8%), followed by Bidayuh with 4/17 (23.5%) and Sino with 1/17(5.9%). These data demonstrated that βº-SEA deletion was not uncommonly reported in Malaysia especially in Sarawak, and commonly seen in the Chinese population.

The hematological parameters and RBC indices of heterozygous βº-SEA deletion were significant differences from other βº-thalassemia mutations except for RBC. The mean Hb for heterozygous βº-SEA deletion (13.43±1.40 g/dL) was significantly higher than heterozygous IVS 1-1 and Codon 41/42 (Post hoc test, p<0.05). As compared to other βº mutations group, the mean Hb level for βº-SEA is within normal limit with hypochromic microcytic red cell similar to δβ and HPFH groups. The median for MCV and MCH of βº-SEA deletion was significantly higher than other heterozygotes βº-thalassemia traits (Man Whitney test, p<0.05).

The patient with β° -thal SEA deletion had Hb A2 level of classical β-thalassemia trait with Hb F level of classical HPFH or δβ carrier. The median for HbA2 was (4.00+1.00%) similarly observed in other β° -thalassaemia group except IVS 1-1 mutation (median of 5.30+ 0.45%) and it was statistically significant (Mann Whitney test, p<0.05). Interestingly, we found the HbF level for β° -thal SEA deletion was statistically higher as compared to other β° mutation with median of (19.00+ 5.50%, p<0.05) except for 3.5kb deletion group.

Conclusion

We conclude that β° -SEA deletion is a unique beta zero thalassaemia trait. This cases provides valuable information for accurate genetic counselling. Although the deletion region only involve the beta globin gene, it presented as a phenotype of HPFH. The possible mechanism of such variation will further be elucidated.

Key wards: β-thalassemia, HPFH, δβ-thalassemia