Interaction of Hb South Florida (codon 1; GTG→ATG) and HbE, with β-thalassemia (IVS1-1; G→A): expression of different clinical phenotypes

Abstract

Introduction Interactions of different hemoglobin variants with thalassemia alleles can result in various clinical phenotypes. HbE-β-thalassemia generally manifests with severe anemia where individuals exhibit β-thalassemia major with regular blood transfusions or β-thalassemia intermedia with periodic blood transfusions. This study presents a unique Malay family with three β-globin gene defects—HbE, Hb South Florida, and IVS1-1 (G→A). Materials and methods HbE activates a cryptic splice site that produces non-functional mRNAs. Hb South Florida is a rare β-hemoglobin variant, and its interactions with other β-thalassemia alleles have not been reported. IVS1-1 is a Mediterranean mutation that affects mRNA processing giving rise to βo-thalassemia. Results and discussion Fifteen mutations along the β-globin gene complex were analyzed using the amplification refractory mutation system. Hb South Florida was identified by direct sequencing using genomic DNA Conclusion The affected child with HbE/IVS1-1 produced a β-thalassemia major phenotype. Compound heterozygosity for Hb South Florida/IVS1-1 produced a β-thalassemia carrier phenotype in the mother.

Keyword: Amplification refractory mutation system; Direct sequencing; Ethnic groups; Structural hemoglobin variants; Thalassemia