NEW MATHEMATICAL FORMULA FOR DIFFERENTIATING THALASSEMIA TRAIT AND IRON DEFICIENCY ANEMIA IN THALASSEMIA PREVALENT AREA: A STUDY IN HEALTHY SCHOOL-AGE CHILDREN

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Abstract. Iron deficiency anemia (IDA) and thalassemias are common diseases especially in the Mediterranean, Middle East and Asian regions. Both conditions show the same clinical findings of hypochromic and microcytic red blood cells. Although previous studies have devised mathematical formulae to differentiate between these two conditions, the prevalence of α- and β-thalassemias among the affected populations may undermine the accuracy of these formulae. This study generated a new formula that was able to differentiate IDA and thalassemia traits and to determine the incidence rates of IDA and thalassemia traits. A total of 345 healthy Thai children with a mean age (± SD) of 11.3 (± 1.7) years were enrolled. Complete blood count, iron status, hemoglobin typing and DNA for α-1 thalassemia identification were investigated. Discriminant analysis was used to create a new mathematical formula containing significant variables to differentiate between IDA and thalassemia traits. The new formula of (1.5 Hb-0.05 MCV >14) had a receiver operator characteristic curve of 0.92 in differentiating thalassemia traits from IDA, with sensitivity and specificity of 84.6 and 87.5%, respectively. The incidence of IDA and thalassemia traits in the study group was 12% and 32%, respectively. This formula should be useful as a screening tool to differentiate between these two conditions.

Keywords: anemia, children, formula, iron deficiency anemia, thalassemia trait