Determining the best discrimination index from Full Blood Count parameters for screening of Beta thalassemia carriers in Sri Lanka.

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Objectives To determine the hematological indices suitable for screening of Beta thalassemia trait(BTT) in Sri Lanka and to derive a suitable discrimination index.

Methods BTT confirmed by HPLC(HbA2>3.5%) at MRI were selected and FBC,serum-iron-studies were analyzed. Patients without iron deficiency (serum ferritin level<15 µg/L), were selected. Hb, RBC Count, MCV, MCH, MCHC, and RDW were tabulated for each patient. These details were analyzed using the Mentzer , Srivastava , England and Fraser , Shine and Lal , Green and King and Thal Index.The sensitivity of each index for detecting Beta Thalassemia trait was calculated using SPSS.

Results 157 BTT cases (wiithout concurrent iron deficiency) and 206 BTT without Ferritin results were analyzed. Ranges and mean for each of the RBC parameters were as follows in the BTT group who were not iron deficient. Hb 6.5–14 g/dl; mean 9.7g/dl. RBC count 2.6 – 6.8; mean 4.9. MCV 48-79fl; mean 64 fl. MCH 15.6-29.7pg ;mean 19.9pg. MCHC 26.7–39.2 g/dl ; mean 31 g/dl . RDW 11.8–44.5 %; mean 17.6%. Detection sensitivity for each indexes , in the BTT group without iron deficiency were , England and Fraser Index - 25.3% ; Srivastava Index - 44.2%; Green and King Index-61.5% Thal Index-73.3% ; Shine and Lal Index–98.7% . The Sensitivity for Shine and Lal Index when applied to the group of BTT without S. Ferritin reports is 99.1%.

Conclusions Shine and Lal Index ($MCV^2 \times MCH/100$) with a Sensitivity Index of 98.7% is the most reliable index to identify Beta Thalassemia Trait cases in Sri Lanka , when iron deficiency has been ruled out. All RBC parameters except MCHC were outside the normal ranges, however a mean MCV of 64 fl with SD of 4.5 and MCH of 19.9 with a SD of 2 best denote a BTT on FBC.