

INTISARI

Anemia mikrositik merupakan anemia yang sering dijumpai pada keadaan Talasemia Beta *trait* (β -TT)/hemoglobinopati dan defisiensi besi. Remaja putri cenderung berisiko menderita anemia. Identifikasi pembawa sifat β -TT/hemoglobinopati berperan untuk mencegah pewarisan penyakit ini. Elektroforesis Hemoglobin merupakan pemeriksaan baku emas β -TT/hemoglobinopati, namun relatif sulit dan mahal. Perlu adanya teknik skrining yang mudah, murah, dan memiliki performa terbaik untuk populasi Asia Tenggara. Penelitian ini bertujuan untuk mengetahui validitas Indeks Srivastava dan Indeks Shine *and* Lal untuk skrining β -TT/hemoglobinopati pada remaja putri.

Penelitian ini merupakan uji diagnostik dengan menggunakan desain potong lintang (*cross sectional*). Subjek penelitian adalah remaja putri yang mengikuti program skrining anemia di Departemen Patologi Klinik dan Kedokteran Laboratorium Fakultas Kedokteran, Kesehatan Masyarakat dan Keperawatan UGM / Instalasi Laboratorium Terpadu RSUP Dr. Sardjito Yogyakarta. Pemeriksaan darah lengkap dilakukan dengan alat Sysmex XN-1000. Dilakukan perhitungan Indeks Srivastava dan Indeks Shine *and* Lal yang selanjutnya dibandingkan dengan parameter baku emas Elektroforesis Hemoglobin untuk mengetahui nilai sensitivitas dan spesifisitas. Analisis statistik menggunakan rerata \pm SB, median (minimum-maksimum), uji beda *independent t test*, *Mann Whitney*, ROC untuk sensitivitas dan spesifisitas. Penelitian ini melibatkan 90 subjek memenuhi kriteria inklusi dan eksklusi. Kurva ROC didapatkan nilai AUC Indeks Srivastava adalah 0,693 (*standard error* 0,081, 95% CI: 0,535 - 0,851), $p < 0,001$, sementara nilai AUC untuk Indeks Shine *and* Lal adalah 0,724 (*standard error* 0,067, 95% CI: 0,594 - 0,855), $p < 0,001$. *Cut-off* terpilih untuk Indeks Srivastava sesuai sensitivitas optimal 80% dengan 95%CI: 51.9 - 95.7 dan spesifisitas 57,33% adalah 4,9; dan untuk Indeks Shine *and* Lal sesuai sensitivitas optimal 73,33% dengan 95%CI: 44.9 - 92.2 dan spesifisitas 66,67% adalah 1293.

Pada nilai *cut-off* Indeks Srivastava 4,9 dengan sensitivitas 80% (95%CI: 51.9 - 95.7), spesifisitas 57,33%; dan nilai *cut-off* Indeks Shine *and* Lal 1293 dengan sensitivitas 73,33% (95%CI: 44.9 - 92.2), spesifisitas 66,67% tidak menunjukkan performa terbaik untuk skrining β -TT/hemoglobinopati pada remaja putri.

Kata kunci: Indeks Srivastava, Indeks Shine *and* Lal, Talasemia Beta Trait, anemia, remaja putri

ABSTRACT

Microcytic anemia is frequently found in the condition of beta-thalassemia trait (β -TT) / hemoglobinopathy and iron deficiency. Female adolescent tends to be at risk of suffering from anemia. Identification of β -TT / hemoglobinopathy carriers plays a role in preventing the inheritance of the disease. Hemoglobin electrophoresis is the gold standard of β -TT / hemoglobinopathy, but it is relatively difficult and expensive. There is a need for a screening technique that is easy, inexpensive, and has the best performance for the Southeast Asian population. This study aims to determine the validity of the Srivastava Index and Shine and Lal Index for β -TT / hemoglobinopathy screening in female adolescent.

This study was a diagnostic test with a cross sectional design. The research subjects were female adolescent who participated in the anemia screening program at the Department of Clinical Pathology and Laboratory Medicine, Faculty of Medicine, Public Health and Nursing UGM / Integrated Laboratory Dr. Sardjito General Hospital Yogyakarta. A complete blood test is performed with the Sysmex XN-1000. The Srivastava Index and Shine and Lal Index were calculated and then compared with the gold standard Hemoglobin Electrophoresis (HbA₂> 3.5%) to determine the sensitivity and specificity. Statistical analysis used mean \pm SB, median (minimum-maximum), independent t test, Mann Whitney, ROC for sensitivity and specificity. This study was conducted on 90 female adolescents who met the inclusion and exclusion criteria. This study involved 90 subjects meeting the inclusion and exclusion criteria. The ROC curve obtained the AUC value for the Srivastava Index was 0.693 (standard error 0.081, 95% CI: 0.535 - 0.851), $p < 0.001$, while the AUC value for the Shine and Lal Index was 0.724 (standard error 0.067, 95% CI: 0.594 - 0.855) , $p < 0.001$. The cut-off was selected for the Srivastava Index according to the optimal sensitivity of 80% with 95% CI: 51.9 - 95.7 and specificity of 57.33% was 4.9; and for Shine and Lal Index according to the optimal sensitivity of 73.33% with 95% CI: 44.9 - 92.2 and specificity of 66.67% is 1293.

Cut-off value of Srivastava Index 4.9 with a sensitivity of 80% (95% CI: 51.9 - 95.7), specificity 57.33%; and cut-off value of Shine and Lal Index 1293 with a sensitivity of 73.33% (95% CI: 44.9 - 92.2), specificity of 66.67% did not show the best performance for β -TT / hemoglobinopathy screening in female adolescent.

Keywords: Srivastava Index, Shine and Lal Index, Beta Thalassemia Trait, anemia, female adolescent