

INTISARI

Latar Belakang: Leukemia akut merupakan keganasan hematologi dengan mortalitas tinggi. Di Indonesia, pemeriksaan morfologi sumsum tulang masih menjadi metode utama diagnosis leukemia, namun memiliki keterbatasan pada morfologi sel blas non spesifik atau hasil sitokimiawi tidak mendukung. Pemeriksaan *immunophenotyping* dapat meningkatkan akurasi diagnosis melalui deteksi ekspresi antigen spesifik, namun terkendala biaya yang mahal dan ketersediaan panel. *Acute Leukemia Orientation Tube (ALOT)* merupakan panel skrining *immunophenotyping* untuk membedakan *lineage* mieloid dan limfoid secara efisien dan lebih terjangkau, namun data mengenai kesesuaiannya dengan pemeriksaan morfologi masih terbatas.

Tujuan: Menganalisis kesesuaian diagnosis laboratoris leukemia akut berdasarkan pemeriksaan morfologi dan sitokimiawi sumsum tulang dengan *immunophenotyping* panel skrining.

Metode: Studi observasional analitik dengan desain *cross sectional* ini dilakukan di RSUP Dr. Sardjito, Yogyakarta. Pasien anak dan dewasa suspek leukemia akut menjalani pemeriksaan morfologi dan sitokimiawi sumsum tulang menggunakan *Sudan Black B* dan *Periodic Acid Schiff*. Pemeriksaan dilanjutkan dengan *immunophenotyping* panel skrining untuk mendeteksi penanda *lineage*. Analisis kesesuaian menggunakan *concordance rate* dan koefisien *Cohen's Kappa*.

Hasil: Pemeriksaan morfologi dan sitokimiawi sumsum tulang menunjukkan diagnosis ALL pada 38 kasus (67,8%), AML pada 15 kasus (26,8%), dan morfologi non spesifik pada 3 kasus (5,4%). Berdasarkan *immunophenotyping*, lini limfoid 40 pasien (71,4%), lini mieloid 14 pasien (25%), dan *mixed phenotype acute leukemia (MPAL)* 2 pasien (3,6%). *Concordance rate* antara pemeriksaan morfologi dan *immunophenotyping* panel skrining mencapai 94,6%, dengan nilai *Cohen's Kappa* sebesar 0,84 yang menunjukkan kesesuaian sangat kuat. Ketidaksesuaian terutama ditemukan pada kasus dengan morfologi non spesifik dan ekspresi antigen yang minimal pada *immunophenotyping*.

Simpulan: Tingkat kesesuaian antara morfologi dan sitokimiawi sumsum tulang dengan *immunophenotyping* panel skrining pada leukemia akut menunjukkan *concordance rate* sebesar 94,6%, dengan nilai *Cohen's Kappa* sebesar 0,84 yang mencerminkan tingkat kesesuaian sangat kuat.

Kata kunci: morfologi sumsum tulang, *immunophenotyping*, *acute myeloid leukemia*, *acute lymphoblastic leukemia*, *Cohen's Kappa*

ABSTRACT

Background: Acute leukemia is a hematologic malignancy with high mortality. In Indonesia, bone marrow morphology and cytochemical examination remain the primary diagnostic methods; however, these methods have limitations in cases with non-specific blast morphology or inconclusive cytochemical results. Immunophenotyping can improve diagnostic accuracy through the detection of specific antigen expression, but its use is often limited by high cost and the availability of antibody panels. The Acute Leukemia Orientation Tube (ALOT) is an immunophenotyping screening panel designed to efficiently and more affordably differentiate myeloid and lymphoid lineages. However, data regarding its concordance with morphological examination remain limited.

Objective: To analyze the concordance of laboratory diagnosis of acute leukemia based on bone marrow morphology and cytochemical examination with immunophenotyping screening panel results.

Methods: This analytical observational study with a cross-sectional design was conducted at Dr. Sardjito General Hospital, Yogyakarta. Pediatric and adult patients suspected of acute leukemia underwent bone marrow morphology and cytochemical examination using Sudan Black B and Periodic Acid–Schiff staining. Immunophenotyping screening panel analysis was subsequently performed to detect lineage markers. Concordance was evaluated using the concordance rate and Cohen's Kappa coefficient.

Results: Bone marrow morphology and cytochemical examination showed acute lymphoblastic leukemia (ALL) in 38 cases (67.8%), acute myeloid leukemia (AML) in 15 cases (26.8%), and non-specific morphology in 3 cases (5.4%). Immunophenotyping results showed lymphoid lineage in 40 patients (71.4%), myeloid lineage in 14 patients (25%), and mixed phenotype acute leukemia (MPAL) in 2 patients (3.6%). The concordance rate between morphological examination and immunophenotyping screening panel was 94.6%, with a Cohen's Kappa value of 0.84, indicating very strong agreement.

Conclusion: Bone marrow morphology and cytochemical examination showed a very strong concordance with the immunophenotyping screening panel in the diagnosis of acute leukemia.

Keywords: bone marrow morphology, immunophenotyping, acute myeloid leukemia, acute lymphoblastic leukemia, Cohen's Kappa