

# COMPARATIVE ANALYSIS OF THE MORPHOLOGICAL AND FLOW CYTOMETRY RESULTS IN ENUMERATION OF BLASTS FOR DIAGNOSIS OF ACUTE MYELOID LEUKAEMIA

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**BACKGROUND AND OBJECTIVES:** Acute myeloid leukaemia (AML) is an aggressive haematological malignancy characterized by the uncontrolled proliferation and accumulation of leukemic blasts in the bone marrow and/or peripheral blood. Accurate identification and quantification of blasts are essential for diagnosis. Although morphological assessment remains the gold standard, modern practice increasingly incorporates additional laboratory techniques. This study aimed to compare blast quantification using peripheral blood smears (PBS), bone marrow aspirate smears (BMAS), and multiparameter flow cytometry (MFC) in patients diagnosed with AML.

**METHODS:** A cross-sectional retrospective review of newly diagnosed AML cases was conducted. Morphological evaluation included assessment of blast cell size, cytoplasmic, and nuclear features on PBS and BMAS. Comparative analysis of blast percentages between BMAS and MFC was performed for 84 paired samples. Statistical analysis was conducted using STATA version 18.5, with associations assessed using the Chi-square test, Cramér's V, Gamma, and Kendall's tau-b ( $p < 0.05$ ).

**RESULTS:** The study included 107 participants, predominantly female (56.1%), with a mean age of 39.6 years. Myeloblasts accounted for 92.5% of cases and promyeloblasts 7.5%. Morphological features showed significant associations ( $p < 0.001$ ), with strong concordance for cell size (Cramér's V = 0.618), nuclear features (0.539), and cytoplasmic inclusions (0.635). Blast percentages between BMAS and MFC were significantly associated ( $\chi^2 = 88.174$ ,  $p < 0.001$ ), demonstrating a moderately strong correlation (Cramér's V = 0.512).

**CONCLUSION:** This study demonstrated strong morphological concordance between peripheral blood and bone marrow smears, with a moderate correlation in blast percentage quantification between BMAS and MFC. While MFC provides more objective and precise blast enumeration, morphological assessment remains essential for the diagnosis and classification of AML.

Integrating these approaches enhances diagnostic accuracy by improving sensitivity and specificity.