

Diagnostic Importance of Flow Cytometry Multiparametric Immunophenotyping in Myelodysplastic Syndrome

Adela Perolla^{1*}, Valentina Semanaj², Teuta Curaj², Genc Sulcebe²

¹ Department of Internal Medicine, Service of Hematology,
University Hospital Center “Mother Teresa”, Tirana, Albania

² Laboratory of Immunology and Histocompatibility,
University Hospital Center “Mother Teresa”, Tirana, Albania

Abstract

Background: Myelodysplastic Syndromes (MDS) represent a heterogeneous group of clonal hematological disorders characterized by ineffective hematopoiesis, cytopenias, and a predilection to evolve into Acute Myeloid Leukemia (AML). While traditional diagnostic paradigms based on bone marrow morphology and cytogenetics are well-established, they can often be inconclusive, especially in low-grade cases. This study evaluates the diagnostic and prognostic utility of flow cytometry multiparametric immunophenotyping (FCMI) in MDS.

Methods: 50 patients with suspected MDS were subjected to leukocyte immunophenotyping between 2011 and 2013. Bone marrow samples

were analyzed using a Beckman Coulter Epics XL flow cytometer, and multiple cell markers were studied. The control group comprised ten individuals with normal bone marrow.

Results: Flow cytometry revealed an immunophenotypic profile markedly more prevalent in suspected MDS patients than AML cases. This profile, characterized by the presence of CD34, CD117, HLA-DR, CD13, and CD33 cell markers, was found in 98% of MDS cases, aiding in their differentiation from AML cases. A significant increase in Side Scatter (SS) among myeloblastic cells further substantiated MDS diagnosis.

Conclusion: Our findings endorse the value of FCMI as a reliable complementary diagnostic

tool in MDS, especially when traditional methods yield ambiguous results. Flow cytometry can improve disease staging and guide treatment strategies by differentiating MDS from AML. As diagnostic capabilities evolve, an integrated approach that combines traditional methods with flow cytometry could offer a more comprehensive diagnosis and nuanced understanding of MDS.

Keywords: Myelodysplastic Syndromes (MDS), Flow Cytometry Multiparametric Immunophenotyping (FCMI)