Role of Flow Cytometry in the Diagnosis of Acute Promyelocytic Leukemia

To the Editor

We read with great interest the article by Dong et al.1 The authors have identified a panel of markers in flow cytometry (FCM) that can help diagnose acute promyelocytic leukemia (APL) with great accuracy. We hereby share a similar experience.

APL is a medical emergency requiring prompt diagnosis and early intervention. FCM facilitates a rapid diagnosis, since laboratory detection of reciprocal translocation t(15;17) by either conventional cytogenetics or molecular genetic studies cannot provide an immediate answer. The conventional way of picking up APL cases, through the absence of CD34 and/or HLA-DR in the background of acute myeloid leukemia markers by FCM, does not have 100% sensitivity and specificity.2 However, Dong et al1 showed that FCM can indeed rapidly identify all APL cases with high specificity independent of underlying cytogenetic abnormalities. They analyzed 149 cases of APL and found that the triple negativity of HLA-DR, CD11b, and CD11c picked up all cases of APL. We did a retrospective study of 16 APL cases that were analyzed with FCM, using detailed myeloid panels of CD13, CD33, CD14, CD117, CD15, CD16, CD34, CD11b, and c-MPO in past 5 years in the Department of Hematology, Sir Ganga Ram Hospital, New Delhi, India. We looked for a similar sort of pattern that could identify all cases of APL. In addition, we examined their cytomorphology.

Among the 16 patients analyzed, there was marked male preponderance (male-to-female ratio of 15:1). Their ages ranged from 4 to 65 years (mean, 37 years).

Hemoglobin ranged from 5.7 to 13 g/dL, with a total leukocyte count of 1.4 to 85.1 × 10^3/μL. Fifteen patients (93%) displayed characteristic hypergranular morphology (typical variant), and 1 patient (7%) showed microgranular morphology. However, faggot cells were observed in only 7 (44%) cases. Immunophenotyping revealed that all patients had abnormal cells with intermediate to high side scatter and dim CD45 expression. HLA-DR was negative in 15 patients (93%). One patient showed dim expression of HLA-DR (7%). All 16 patients (100%) were negative for CD34, CD14, and CD11b. One patient with a hypogranular variant was negative for HLA-DR and CD34 but showed an aberrant expression of CD4.

It appears, therefore, that the combined negative expression of HLA-DR, CD34, CD11b, and CD14 in the background of myeloid-specific antigens provides a rapid diagnosis of APL by FCM in almost all cases. Additional use of CD11c would have further added value to this conclusion.

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References
