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Detection of Lymphoid Neoplasms in Bone Marrow by Flow Cytometric Analysis and Comparison to Bone Marrow Aspiration and Biopsy

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Abstract

Background: Lymphoid neoplasms are a heterogeneous group of hematologic malignancies. Bone marrow (BM) can be involved in a certain proportion of lymphoid neoplasms, necessitating accurate and rapid diagnosis of such involvement for early therapeutic decision.

Objective: To evaluate the diagnostic utility of flow cytometry (FC) for assessment of BM involvement by lymphoid neoplasms. BM biopsy (BMBx) was used as the gold standard and BM aspiration (BMA) was used as a comparison.

Material and Method: Two hundred and eighty-three samples with a clinical suspicion for lymphoid neoplasms were received in FC laboratory and analysed using various lymphoid markers. The FC results were then compared to BMA and BMBx.

Results: Of 283 cases, 94 had lymphoid neoplasms by BMBx (33%). Among the positive BMBx cases, concordant agreement of all three investigations was found in 45 cases (48%). FC was positive in 52/94 cases (55%) while BMA was positive in 62/94 cases (66%). Among the negative BMBx cases, FC was positive in 8/189 cases (4%) and BMA was positive in 56/189 cases (30%). FC and BMA were both negative in 25/94 cases (27%). The specificity of FC and BMA was 96% and 60% while the sensitivity was 55% and 65%, respectively. Subtype agreements were better between FC and BMBx than BMA and BMBx, particularly in small lymphoid neoplasms.

Conclusion: BMA tended to overdiagnose lymphoid neoplasms and could not accurately differentiate subtypes of B-cell and T-cell neoplasms. FC correlated more with BMBx and had less false positivity than BMA. Further utilization of broader FC markers may help to improve the diagnostic capability and sensitivity of FC.

Keywords: Lymphoid Neoplasms, Flow cytometry, Immunopheno typing, Bone marrow aspiration, Bone marrow biopsy

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