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Clonality assessment of B non-Hodgkin's lymphoma by multiparameter flow cytometry of bone marrow biopsy: An additional diagnostic tool

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Background: Bone marrow biopsies are generally included in the initial staging evaluation of NHL and BM involvement has unique prognostic implication in different histological subgroups of the disease. Flow cytometric data should always be correlated with BM biopsy finding, immunophenotyping of core biopsy allows parallel morphologic examination and is capable of generating multivariate, quantitative, immunophenotypic data useful in diagnosis of NHL.

Aim: To evaluate the role of flow cytometric immunophenotyping (FCI) of lymphoma biopsy samples next to immunohistochemistry and histopathology for better diagnosis and characterization among Egyptian patients.

Subjects & Methods: 60 B-NHL patients stage IV, diagnosed after histopathological examination of lymph node biopsy or fine needle aspiration (FNA) of other primary site and staged according to Ann Arbor system. Clonality assessment was established using Flow cytometric (FCM) immunophenotypic analysis of BMA and biopsy after obtaining single cell suspensions by mechanical disaggregation, with a restricted panel of (CD45, CD20, CD3, CD19, anti Kappa and anti Lambda) using (BD FACScan 4 color flowcytomtery). In addition to histopathology of paraffin-embedded BM trephine biopsy with immunohistochemical (IHC) staining for morphological BM evaluation and clonality assessment.

Results: FCI analysis of BMB samples showed 24/60 cases (40%) positive for infiltration by B- monoclonal lymphocytes with light chain restriction and 36/60 (60%) negative cases, while BMA positive in only 16.7%, negative in 76.7%, and 6.7% dry tap with difficult FCM analysis. FCI of core biopsy versus histopathological assessment and light chain expression and restriction detection by IHC revealed concordance rates of 63.6 % and 85% and discordance rates of 36.4% and 15%. Clonality assessment and light chain expression detection revealed a kappa value of 0.708 for IHC versus FCM with concordance of 85% and discordance 15%.

Conclusion: Our results showed fair agreement level for IHC and FCM of BMB, yet FCM is faster, specific and has a more definite role in detection of monoclonality of NHL, so accurate assessment of hematolymphoid neoplasms requires an integrated multiparameter approach. Although morphologic histopathologic examination remains the mainstay of initial assessment, immunophenotypic analysis of core biopsy is essential to determine the pattern of differentiation and detect minimal disease when morphology is inconclusive. Finally, an integrated approach using multimodality technologies is a must with identifying the strengths, weaknesses, and limitations to be an efficient and cost-effective method for better assessment.

Biography

Reham Ahmed Rashed has completed her PhD in May, 2008 from Cairo University and Postdoctoral studies from National Cancer Institute, Cairo University, Cairo, Egypt. She is an Assistant Professor in the Hematology Department of National Cancer Institute. Her research objective focuses on the search and study on the diagnosis, prognosis and treatment of different types of leukemia and lymphoma with other solid tumours and approaching this study by applying molecular biology techniques and bone marrow biopsy with different immunohistochemical staining. She has published more than 10 papers in reputed journals to serve the field of interest in research.

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