Detection of Monoclonal B-Cell Populations by Polychromatic Flow Cytometry in Cerebrospinal Fluid Specimens From Patients With Demyelinating Disease

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Flow cytometric immunophenotyping is an established method for the detection of occult leptomeningeal disease in patients with aggressive B-cell non-Hodgkin lymphoma, and is increasingly being used in the evaluation of patients without an established diagnosis of lymphoma who present with signs and/or symptoms referable to the central nervous system. However, the specificity of flow cytometric immunophenotyping in the identification of monoclonal B-cell populations in cerebrospinal fluid has not been systematically evaluated. Moreover, despite more widespread integration of polychromatic flow cytometry into the clinical laboratory, its impact on the specificity of monoclonal B-cell detection in cerebrospinal fluid has not been addressed. We searched a consecutive series of cerebrospinal fluid specimens submitted to the Special Hematology Laboratory of Hartford Hospital for polychromatic (8-color) flow cytometric immunophenotyping between June 2010 and December 2012 for cases in which a monoclonal B-cell population was detected in patients without clinical or radiographic evidence of lymphoma upon complete clinical evaluation. We identified three cerebrospinal fluid specimens in which a monoclonal B-cell population was detected by polychromatic flow cytometry in patients whose subsequent clinical and radiologic evaluation provided no evidence for lymphoma. In all three patients, each of whom was found to have oligoclonal bands in the cerebrospinal fluid, a diagnosis of demyelinating disease was ultimately rendered upon completion of the clinical evaluation. We conclude that the detection of a monoclonal B-cell population in cerebrospinal fluid by polychromatic flow cytometry is not diagnostic of occult leptomeningeal involvement by a B-cell non-Hodgkin lymphoma. Moreover, our data suggest that monoclonal B-cell populations detectable by polychromatic flow cytometry may be prevalent in patients with demyelinating disease, and highlight the importance of clinicopathologic correlation in this application of polychromatic flow cytometry.

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