Immunophenotyping analysis in cerebrospinal fluid of pediatric patients with acute lymphoblastic leukemia.

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INTRODUCTION: Cerebrospinal involvement is a frequent complication of haematological malignancies, with an incidence of up to 25% in leukemias and lymphomas. The diagnostic gold standard to detect cerebrospinal fluid (CSF) involvement is cytologic examination by light microscopy; unfortunately, this technique is characterized by low sensitivity and low specificity.

OBJECTIVE: Asses the diagnostic accuracy of flow cytometric (FCM) immunophenotyping in comparison with classic cytology for diagnosing central nervous system (CNS) infiltration in ALL.

MATERIALS AND METHODS: One hundred four CSF specimens from pediatric patients with ALL were examined by FCM for immunophenotyping. CSF fluid analysis was performed as part of their routine work up. The results were compared to classic cytology routinely done for all samples. Medical ethical committee of HIMFG approved this study.

Patients. Children with ALL were eligible for inclusion in this study if they met the following criteria 1) they were newly diagnosed with ALL; 2) no prior chemotherapy and radiotherapy had been administered.

Cells for immunophenotyping were obtained from 1 to 2 ml aliquot of CSF collected during the initial diagnostic lumbar puncture. All samples were studied within 6 hours of collection. Monoclonal antibodies against cell surface antigens included CD10 and TdT.

RESULTS: In this work 104 CSF were examined. Nineteen were positive [19/104 (18.2%)] and 85 negative for light microscopy. Twenty-five samples were positive by FCM [25/104(24%). A total of 25/104 positive samples were detected; 14 samples were positive for both FCM and cytology [14/30 (46.6%)]. Eleven samples were positive by FCM and negative by cytology [11/30(36.65)]. Five samples were positive by cytology and negative by FCM [5/30(16.6%)].

Intraobserver agreement for light microscopy was in our study, with a k index of 0.53

	Cytology		
	Positive	Negative	
Immunophenotyping by FCM			
Positive	14	11	25
Negative	5	74	79
	19	85	104

Detection of CNS infiltration by FCM in comparison to cytology in ALL patients.

CONCLUSIONS: The diagnosis values of FCM are two-three times more than that of cytology. Immunophenotyping by FCM is recommended for routine diagnosis of CSF infiltration combined with cytology to increase the diagnosis yield.