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REFERENCES


Mononuclear Cell Markers in Childhood Leukemia

To The Editor:

We read with interest the excellent article by Barrett et al.1 They described 21 children with acute lymphoblastic leukemia and one child with lymphoblastic lymphoma. Utilizing assays for determining E, EAC, and zymosan-complement rosettes, lymphoblasts from four children of group I contained receptors for E rosettes (group I1) cells. Lymphoblasts from four other cases (group II) contained a paucity of complement receptors and were classified as null cells. Lymphoblasts from four other cases (group II) contained receptors for E rosettes and complement. In none of their patients did lymphoblasts exhibit only complement receptors. In addition, four children of group I and all four children of group II had mediastinal masses.

We have recently studied a patient with acute lymphoblastic leukemia and a large mediastinal mass; in contrast to the study of Barrett et al., lymphoblasts obtained from bone marrow displayed only complement receptors.

The patient was a 6-year-old girl who presented to Upstate Medical Center with a 3-day history of pallor and malaise. The child had no ecchymoses, lymphadenopathy, or hepatosplenomegaly. Her laboratory studies included a Hgb of 6.4 g/dl, Hct 19.3%, and WBC 3.5 x 103/μl with 31% lymphoblasts, 1% myelocytes, 5% bands, 3% neutrophils, 49% lymphocytes, and 11% monocytes. The platelet count was 3000/μl. Chest x-ray showed an anterior mediastinal mass. The bone marrow aspirate contained 58% lymphoblasts, 37% immature lymphocytes, and 5% mature lymphocytes.

Lymphoblasts were studied for mononuclear cell markers and assayed for a variety of cytochemical enzymes. The results showed 98% EAC and 6% E rosettes. No cells contained surface membrane immunoglobulin and no cells demonstrated latex phagocytosis. Cytochemical stains showed that 90% of lymphoblasts were positive for β-glucuronidase. However, lymphocytes were negative for peroxidase, Sudan black B, acid phosphatase, and α-naphthyl acetate and butyrate esterases.

The current case is similar to two cases reported by Jaffe et al.,2 and three cases presented by Coccia et al.3 The exact lineage of these neoplastic cells with only complement receptors is not certain. Although the ability to form EAC rosettes is characteristic of B lymphocytes, a small population of T cells also has receptors for complement.1,2,4 One must be cautious about the interpretation of mononuclear cell markers in malignant cells because they may be lost or distorted and other markers retained during malignant transformation.

In summary, we believe that lymphoblasts from patients with acute lymphocytic leukemia and lymphoblastic lymphoma associated with mediastinal masses are heterogeneous and can display a variety of cell surface markers.

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REFERENCES


Mononuclear Cell Markers in Childhood Leukemia: Reply

To the Editor:

The letter by Alarcon et al. is interesting, as is their observation of lymphoblasts with only complement receptors in a child with acute lymphoblastic leukemia (ALL). This finding may be rare, since in children with ALL leukemic lymphoblasts have been shown to have no markers,1 T cell markers,2,3 or infrequently only surface immunoglobulins.4 However, it is also important to emphasize that in most large studies of surface markers in ALL the presence of complement receptors has not been investigated.2,4 When complement receptor detection is included in surface marker studies, the actual frequency of its presence and its clinical significance may be determined.

In our study of 21 children with ALL we did not detect lymphoblasts with complement receptors alone.6 However, since our study was published, we had the opportunity to examine peripheral blood from a 14-yr-old boy whose lymphoblasts also showed only complement receptors. He presented with a WBC of 3 x 10^9/µL, no mediastinal mass, and died within days after diagnosis.

It has been speculated that the presence of T cell markers on leukemic cells represents leukemic conversion of T cell lymphoma and that these diseases may represent different clinical manifestations of the same neoplastic process.7

Jaffe et al. reported two children with lymphoblastic lymphoma with mediastinal masses whose malignant cells possessed only complement receptors; one had a leukemic progression of the complement receptor positive cells.8 Whether or not the complement receptor in ALL will have similar clinical similarities to complement receptor in lymphoma remains to be determined.

The existence of leukemic lymphoblasts with only complement receptors adds to the increasing evidence on the heterogeneity of ALL and lymphoblastic lymphomas.

Future surface marker studies in childhood lymphoproliferative malignancies that include all B and T cell markers may give us answers to the question whether complement receptor-positive ALL is a distinct disease entity or a different clinical manifestation of complement receptor-positive lymphoma.

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REFERENCES


Mononuclear cell markers in childhood leukemia [letter]

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