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An Interesting Case of Acute Myeloid Leukemia

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INTRODUCTION

AML is the predominant form of leukemia during the neonatal period but represents a small proportion of cases during childhood and adolescence. Approximately 15,000 new cases of AML occur annually, representing approximately 35 percent of the annual new cases of leukemia in the United States[2.]

Monocytic leukemia was first reported by Reschad and Schilling-Torgau[1] in 1913. The proportion of monocytic cells is usually greater than 75 percent. The total leukocyte count is higher in a larger proportion of patients, and hyperleukocytosis occurs more frequently (approximately 35%) than in other variants[3-5]. The marrow and blood cells may be largely monoblasts (acute monoblastic leukemia) or more mature-appearing promonocytes and monocytes (acute monocytic leukemia).

The French-American-British classification (FAB) Classification sub-types of AML based on morphology and cytochemical staining with immunophenotypic data in some instances. Types (M0, M1, M2, and M3) are predominantly granulocytic and differ according to the extent of maturation. M4 is both granulocytic and monocytic, with at least 20% monocytic cells, whereas M5 is predominantly monocytic (at least 50% monocytic cells). M6 shows primarily differentiation with dysplastic features including megaloblastic changes, M7 is acute megakaryocytic leukemia (AML-M7) identified by the presence of megakaryocytic antigens demonstrated by flow cytometry or immunohistochemistry or the presence of platelet peroxides[6].

CASE REPORT

A 43 year old male presented with h/o pain in the right shoulder for 15 days along with restriction of movements for which he was referred to orthopedics, where he was treated with NSAIDS for a week. Later after a week patient came again with the same complaints. Since the patient was not responding to treatment he was investigated with routine investigations, x-ray & MRI screening was done as outpatient. And patient was referred to medicine for ruling out medical causes. There was no history of any hematological disorder. On examination; the patient was moderately built. Physical examination was otherwise unremarkable. L/E- Right shoulder restricted, rotation of movements (painful & restricted), sterna tenderness (+). Peripheral blood smear examination showed many reactive lymphocytes,

most of which appeared blastoid form suggestive of acute leukemia. Investigations revealed a Hb 13.1mg/dl, Total WBC count 5400/cu.mm and platelet count of 1,52,000/cu.mm). The leukocyte differential count was eosinophils-0%, lymphocytes 59%, neutrophils 26%, basophils 0%, monocyte-15%. MRI spine-Sag T2 showing marrow hypointensity replacing fat signals which was indicative of infiltrative marrow disease. Bone marrow smears were stained with Wright-Giemsa and analyzed according to routine clinical laboratory procedures. Bone marrow smear revealed as AML M5a FAB, 61% non-specific esterase positive atypical cells. Therfore a diagnosis of acute monoblastic leukemia was made. Bone marrow aspiration and biopsy showed marrow spaces with focal areas showing hypercellular hematopoeitic elements. Diffuse infiltrate of cells are characterized by large cells with abundant eosinophilic cytoplasm, indented nucleus with prominent nucleoli. Focal areas showed few erythroblasts & megakaryoctes. Immunophenotyping was done to confirm the diagnosis. CD33- 82, CD64- 98.8, HLA DR- 99.8, CD11c- 99.3, CD4-99.4, CD56- 32.5, MPO-negative, CD13- 10.4, CD117- 13.4, CD11B-2.8, CD14- 1.5 The leukemic cells were positive for CD 64, HLA DR, CD33, CD11C, CD4, CD56, CD13, CD117, CD11B, CD14 and negative for MPO. Thus the diagnosis was consistent with AML with monocytic differentiation as the blasts were positive for CD4 and CD14. The biochemical parameters such as uric acid, bilirubin, creatinine, liver enzymes were normal and serum LDH was 511 U/L (225-460). So a diagnosis which was consistent with monocytic leukemia was made.

DISCUSSION

AML subtypes M4 and M5 have a higher incidence of central nervous system (CNS) involvement than other subtypes. Patients can occasionally present with very high white cell counts resulting in features of leukostasis. Diagnosis is usually obvious by the presence of myeloblasts in the peripheral smear though occasionally cases can present with pancytopenia and the diagnosis is only made on evaluation of a bone marrow aspirate. Immaterial of the presence of myeloblasts in the peripheral smear a bone aspirate is mandatory to establish the diagnosis.

Our patient was a 43 year old male. Clinical features are not different from other type of AML but organomegaly is noted frequently in this variant. The marrow and blood cells may be largely monoblasts (acute monoblastic leukemia) or more mature-appearing promonocytes and monocytes (acute monocytic leukemia). In nearly all cases, 10 to 90 percent of monocytic cells react for nonspecific esterase stains in a cytochemical or chemoluminescence assay; or with monoclonal antibodies against monocyte surface antigens, especially CD14. Here in our patient non-specific esterase positive atypical cells were seen. The total leukocyte count is higher in a larger proportion of patients, and hyperleukocytosis occurs more frequently (approximately 35%) than in other variants where as in this patient it was 5400/cu.mm.

Although M5a and M5b share all antigens, some antigens are preferentially expressed in mature cells. For instance, CD4 and CD14 are mainly demonstrated in mature monocytes, so they are often present in M5b cases.

In contrast, CD117 is shown mainly in immature monocytes. CD11b and CD11c are present in both. In our patient CD4 was mainly expressed along with CD11c. So it is consistent with monocytic differentiation. Cytogenetic analysis was not carried out in this case. Patient was referred to oncologist for further management. The usual treatment is with induction chemotherapy followed by consolidation: Options include:– High-dose chemotherapy (nonmyeloablative chemotherapy) – Autologous stem cell transplantation (SCT) – Allogeneic SCT. AML M5 is a rare manifestation. Remission rates have improved dramatically, but remission, 5-year survival, and cure rates are most dependent on the patient's age when AML occurs. Early clinical

diagnosis, along with prompt initiation of multifaceted treatment will help in reducing mortality.