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Atypical Hemolytic Uremic Syndrome preceding B- Lineage Acute Lymphoblastic Leukemia: A Case Report

Mona M Taalab MD, PhD[1], Nadia El Menshawy MD, PhD[2]
1Internal Medicine Department, Faculty of Medicine, Mansoura University, Mansoura City, Egypt.
2Clinical Pathology Department, Faculty of Medicine, Mansoura University, Mansoura City, Egypt.

INTRODUCTION

Acute lymphoblastic leukemia (ALL) results from the uncontrolled proliferation of abnormal hematopoietic progenitor cells, leading to high numbers of blasts and potential infiltration of the central nervous system and testes. The symptoms and signs are generally linked to disrupted hematopoiesis. Atypical Hemolytic Uremic Syndrome (aHUS) represents about 10% of HUS cases. It has a gradual onset with fluctuating clinical and laboratory abnormalities and can be triggered by cancer, pregnancy, drugs, or autoimmune disorders

BACKGROUND

ALL is a hematologic malignancy characterized by the clonal expansion of lymphoid progenitor cells[1].Compared to pediatric patients, adults demonstrate a less favorable prognosis, with previously reported long-term survival rates falling within the range of 30% to 50%[2]. While the origins of this disparity are likely multifaceted, one plausible explanation is the occurrence of biologically aggressive disease driven by adverse-risk genetics[3]. Hemolytic uremic syndrome (HUS) is a Thrombotic Microangiopathy (TMA) primarily affecting the kidneys, encompassing a diverse array of disorders. These include typical HUS associated with Shiga toxin-producing E. coli, secondary HUS linked to conditions such as malignancy, drugs, or autoimmune diseases, and atypical HUS (aHUS)[4]. Most of the cancer associated TMA are seen mainly in solid malignancies. Hematological malignancies like ALL, non-Hodgkin lymphoma, myelodysplasia can also rarely complicated by TMA[5].

AIM

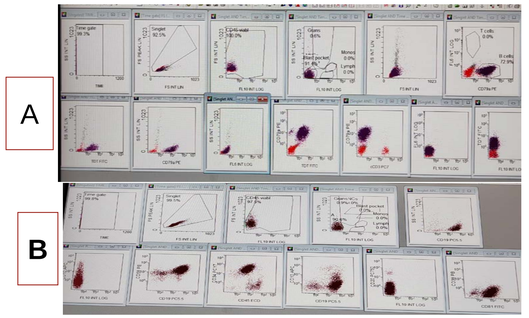
We present a patient with Acute Lymphoblastic leukemia with unusual presentation of acute renal failure due to aHUS.

CASE REPORT

A 22-year-old male patient arrived at the emergency room with an abrupt onset of dizziness accompanied by bone aches and intermittent fever. The physical examination, displayed pallor and jaundice. The complete blood count (CBC) findings revealed a white blood count (WBC) of 7.17 × 10^9/L, a hemoglobin: 7.9 g/dL, and a platelets: 15 × 10^9/L. The peripheral blood film indicated normocytic normochromic anemia, and 5% Schistocytes, with normal WBC in count and morphology. The reticulocyte count was 4%. Additional findings included a lactate dehydrogenase (LDH) level of 3650 U/L, with indirect hyperbilirubinemia and negative direct antiglobulin test (DAT). The serum creatinine level was 10.9 mg/dL, and Shiga toxin was negative in the stool. The clinical picture was consistent with aHUS. Following 5 sessions of hemodialysis, the patient was referred to the hematology outpatient clinic. Subsequent CBC showed WBC of 7.8 × 10^9/L, hemoglobin: 8.5 g/dL, and platelets: 8 × 10^9/L. The peripheral blood smear revealed 1.3% Schistocytes and 20% blast cells. Further assessment via flow cytometry of the bone marrow identified 90% blast cells with positive expression for TdT, CD19, CD10, cCD79a, cCD22 dim to negative), CD58, CD81, CD34, and CD38 (dim to negative), as well as HLADR. The tested cells were negative for CD20, cCD3, CD14, CD123, CD3, CD7, CD56, CD117, CD33, CD13, CD41, and CD61. The BCR/ABL1 for p190 was 100%. This constellation of findings is indicative of Philadelphia positive precursor common B-ALL. The treatment started with combination of Dasatinib and Hyper-CVAD, resulting in complete remission with a BCR-ABL1 transcript level of 0.001%. The patient underwent cranial irradiation and was strongly advised to continue treatment until Allogenic stem cell transplantation.

SUMMARY

A 22-year-old male patient exhibited symptoms consistent with atypical hemolytic uremic syndrome (aHUS) and was subsequently diagnosed with Philadelphia positive precursor common B-cell acute lymphoblastic leukemia. Following treatment with Dasatinib and Hyper-CVAD, the patient achieved complete remission and underwent cranial irradiation. The recommended course of action now includes allogeneic stem cell transplantation to optimize the treatment outcome.



A: Gating was done on 72% of mononuclear cells from viable CD45 population show positive expression for cytoplasmic CD79a , TdT, negative expression for MPO, c CD3. B: Blast population was positive for CD19, CD38. Heterogenous CD10, CD34,CD81,spectrum CD20.

DISCUSSION

aHUS represents a TMA caused by irregularities in the alternative complement pathway, leading to endothelial cell dysfunction and the generation of microvascular thrombi. The condition may be acquired due to the presence of antibodies targeting complement pathways secondary to infections, chemotherapeutic agents, malignancies, and transplants. The pathophysiological mechanisms encompass aberrant bone marrow angiogenesis, aggressive tumor proliferation, and secondary myelofibrosis that detrimentally affects the endothelial cell lining of the marrow vasculature. This damage can occur through direct invasion or due to the administration of chemotherapeutic agents[6]. Initial negative blood films should be retested when clinical suspicion is high.

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