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A Pediatric Case Of Acute B-Cell Lymphoblastic Leukemia - Presenting As Viral Infection

Dr. Mumtaz Sharif, Dr. Amit Saxena, Dr. Swetha Chowdary, Dr. Nikita Menon

***Corresponding Author:**
Dr. Nikita Menon

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Abstract

Background: Pancytopenia is often found in our clinical practice having diverse etiologies, which can range from benign and common conditions like infection (dengue , malaria etc;) to serious and less common causes like malignancies. We report a case of 2.5 year old male child who presented with complaints of fever, abdominal pain and increase frequency and urgency of micturition. On examination he was detected to have anemia, hepatosplenomegaly and a petechial rash. Lab investigation suggestive showed anemia and thrombocytopenia with negative serology for malaria and dengue.However,considering the predominance of tropical infections he was started on empirical antibiotics and antimalarials and given prbc and platelet transfusion in view of persistence of fever he was referred to our centre where we also noticed that he had generalized lymphadenopathy and review of reports revealed normocytic anemia with lymphocytic predominance. Considering the diagnosis of leukemia bone marrow aspirate and biopsy was done even though peripheral smear did not reveal any blast cells. Bone marrow aspirate smear showed >83% blast cells confirming diagnosis.

High index of suspicion with a detailed history, examination and careful review of reports can lead to early diagnosis of sinister causes like malignancy.

Keywords: pancytopenia, marrow infiltration, anemia, thrombocytopenia and dengue

Introduction

Acute lymphoblastic leukemia accounts for about 80% of all childhood leukemias. Acute leukemias are heterogenous group of haematological malignancies in which there are clonal expansion of immature precursors (blast cells) in the bone marrow. The blast cells are either myeloid or lymphoid and are further classified as B cell or T cell. Childhood ALL was first disseminated cancer shown to be curable . ALL has striking peak incidence of 2-3 years of age and occurs more in boys compared to girls. Most of the patients present with malaise,anorexia, fatigue, irritability,intermittent low grade fever and bone and joint pain. However , very few patients presents with fever lasting for more number of days without any specific cause. Sometimes ALL may whole together present with a contrasting picture for instance with thrombocytopenia with petechiae all over, which should be meticulously investigated and not be misdiagnosed as other common ailments like dengue ,malaria etc; Here we discuss a case of a 2.5 year old male child who presented with fever with thrombocytopenia mimicking dengue.

Case Report

A 2.5 year old male child was brought to the outpatient clinic of department of pediatrics at our tertiary care teaching hospital with complaints of fever since 7 days and abdominal pain on and off since 7 days ,patient also had increased urgency and frequency of micturition since 3 days . He is a moderately nourished with adequate weight and height as per his age. He has achieved all milestones as per his age. On examination there was pallor, cervical lymphadenopathy , petechiae and

hepatosplenomegaly with liver size of 5cm and span of 9cm smooth surface, soft in consistency and spleen of 5cm , soft in consistency and non tender.

Table 1 Patients Laboratory Values On Presentation:

PARAMETERS(UNITS)	VALUE
Hemoglobin (g/dl)	6.3
Packed cell volume (%)	18.4
Mean corpuscular volume (fL)	71
Neutrophil/Lymphocyte/ Eosinophil/Monocyte	6.6/90/0.1/3.1
White blood cells (/µL)	13.2
Absolute neutrophil count	680
C – reactive protein	55
Erthyrocyte sedimentation rate	66
Retic count	0.5
Corrected retic count	0.3
Platelets	26000

Based on history ,examination and above mentioned investigations the differentials striking were infectious causes like dengue, malignancies and hemolytic anemias .HB electrophoresis was also done to rule out any underlying hemolytic anemias causing pancytopenia which showed a normal study. Dengue Ns1 and IgM was done which was negative. since there is persistent decrease in cell lines, Bone marrow biopsy and aspiration was planned and was done to rule out any malignancy associated with this pancytopenia . Bone marrow biopsy and aspiration, with peripheral smear suggestive of atypical lymphocytes was suggestive of acute B-cell lymphoblastic leukemias . Immunophenotyping by flow cytometry was done as it allows further risk stratification and CD 34, CD 19,HLA-DR,CD10,Ccd79a marker showed positive expression of which CD34 marker has poor prognosis along with MDR1 (multi drug resistant gene positive) .karyotyping was done to know the specific genetic alterations along with ploidy analysis which showed diploidy in the leukemic blast cells and molecular studies like FISH which help in identifying the translocations more rapidly than those not detected on routine karyotype analysis and help in distinguishing lesions that are cytogenetically identical and molecularly different. FISH studies revealed ETV6::RUNX1- t(12;21)(p13.2;q22.3); which is suggestive that the patient tested positive for substitution in exon 26 of NOTCH1 gene and substitution exon 3 of CSF1R gene, which confer favourable prognosis.

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Discussion

Although ,Acute lymphoblastic leukemia is a common childhood leukemia, this case is rare because of its rare presentation and it is the first disseminated cancer shown to be curable. ALL has a striking peak incidence at 2-3 yrs of age and occurs more commonly in boys than in girls.

Most of the ALL cases are thought to be due to postconception somatic mutation in lymphoid cell. The current system used is the WHO classification of leukemias. Phenotypically, surface markers show that approximately 85% of cases are B-Lymphoblastic leukemia, approximately 15% are T-lymphoblastic leukemia.

It is said to be that studies on thrombocytopenia , which is common finding in picu setting , is a grey area. Dengue being the leading cause , diagnosis of ALL got subsequently delayed in this case . our patient had received a total of 4 transfusions of blood products. It is prudent to treat the clinical presentation in the patient rather than the platelet numbers. Acute lymphoblastic leukemia remains the predominant type of childhood leukemia in our setting . Majority of the patients present with fever , pallor,moreover loss to follow up plagues the treatment completion . Failure of a single cell line, as seen in transient erythroblastopenia of childhood,immune thrombocytopenia and congenital or acquired neutropenia , is rarely the presenting feature of ALL.

Treatment of acute lymphoblastic leukemias largely based on early diagnosis, age at presentation and response to treatment and compliance of the patient. Single most important prognostic factor in ALL is treatment: without effective therapy disease is fatal. There are three phases of treatment part first one being remission induction (lasting for 4 weeks),second phase is the consolidation phase (lasting for 14-28weeks),third phase is the maintenance phase (lasting for 2-3yr). Funding issues also need to be addresses as the commonest cause of loss to follow up or refusal to accept the treatment is the cost implication of the treatments.

Conclusion

Early diagnosis of ALL in pediatric population is important due to rapid progression of disease. It is important to diagnose ALL in early stages and manage accordingly especially patients presenting with unexplained cytopenias and constitutional symptoms. This case highlights the importance of a high clinical index of suspicion for ALL in patients who present with unexplained cytopenias and constitutional symptoms even when there are distracting symptoms and signs.

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