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Original Research Paper

Paediatrics

A RARE CASE OF CHILDHOOD CALL A POSITIVE B-CELL ACUTE LYMPHOBLASTIC LEUKEMIA WITH BCR-ABL TRANSLOCATION

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ABSTRACT I describe a female child aged 7 years who presented with long duration history fever and generalized bony pains and examination showed hepatosplenomegaly with significant generalized lymphadenopathy, petechial,ecchymotic and purpuric spots over whole body. Investigations done revealed TLC of 1.3 lakhs with 8%blasts. Bone marrow picture was suggestive of acute leukemia. Flow cytometry done showed CALL A positive B-cell acute lymphoblastic leukemia. Chromosomal Analysis :GTG Banding revealed 46,XX, t(9;22)(q34;q11.2)[5] suggestive of BCR-ABL Translocation. This is a rare case of childhood CALL A positive acute lymphoblastic leukemia with BCR – ABL translocation.

KEYWORDS : Acute lymphoblastic leukemia, BCR-ABL Translocation, Imatinib, Childhood

INTRODUCTION

Acute lymphoblastic leukemia (ALL) is the most common childhood malignancy all world over[1]. Recent advances with effective chemotherapy in last three decades has changed ALL in children from a universally fatal disease to a curable one in 85% of children[1]. Its incidence is approximately 3-4 cases per 100,000 children below 15 yr of age[2]. There is a peak in the incidence of childhood ALL, between the ages of 2 and 5 yr, due to ALL associated with a pre-B lineage (referred to as *common* ALL)[2]. Boys have higher rates than girls, especially in adolescents with T cell ALL[1]. Survival rates after treatment for acute lymphoblastic leukaemia in children in India are much lower, even in specialized cancer centers[3]. The etiology of ALL remains unknown in a majority of cases[2]. However, several genetic syndromes have been associated with an increased risk of leukemia[2]. In particular, there is a 10-20 fold increased risk of leukemia (ALL and AML) in children with Down syndrome. Other genetic syndromes associated with leukemia include Bloom syndrome, Fanconi anemia, neurofibromatosis, Klinefelter syndrome, immunodeficiency and ataxia-telangiectasia[2]. Exposure to ionizing radiation, certain pesticides and parental smoking are associated with a higher incidence of ALL[1]. Patients having received therapeutic irradiation and aggressive chemotherapy (alkylating agents, epipodophyllotoxins) are at higher risk of developing acute leukemia[1]. ALL is a heterogeneous group of disorders that can be subtyped by morphology, immunophenotyping, cytogenetic study, and molecular techniques[3].The Philadelphia chromosome (Ph) is the hallmark of chronic myeloid leukemia and also occurs in approximately 5% of children and 20% of adults with ALL[1].

This reciprocal translocation juxtaposes the BCR gene on chromosome 22 with the ABL gene on chromosome 9, producing a fusion gene that encodes the BCR-ABL fusion protein[1]. Ph-positivity in ALL is associated with aggressive disease and has been shown to be a poor prognostic factor, especially in children[3]. Thus, Ph positive patients are candidates for more aggressive treatment regimens such as bone marrow transplantation[1]. Even with transplant the relapse rate for Ph ALL is quite high, ranging from 40 to 80% Philadelphia translocation.

t(4;11) which is present in infant leukemia is also associated with poor prognosis[3]. Certain chromosomal abnormalities are associated with a favorable prognosis like t(12;21) and simultaneous presence of trisomy 4 and10.[2]

ALL cells can be classified using the French-American-British (F AB) criteria Into morphologic subtypes [2]. L1 morphology lymphoblasts, are the most common subtype of childhood ALL (80-85%), have scant cytoplasm and inconspicuous nucleoli; these are associated with a better prognosis. Other types are L2 and L3[2].

Immunophenotype classification describes ALL as either B cell derived or T cell derived[4]. Progenitor B cell derived ALL constitutes 80-85% ALL, 15% are derived from T cells and 1-2% from mature B cells.[5]

Patient And Observation

Our 7 year old female child had history of fever of 3 weeks duration which was recorded on daily pattern, being intermittent and was moderate grade.Child had long history of generalized bodyaches also. On examination child had hepatomegaly with liver 5cms below right costal margin total span 9cms, spleenomegaly 10cms below left costal margin(FIG 1,2).Child had multiple cervical , axillary and inguinal lymphadenopathy of varying size. Petechial, purpuric and ecchymotic spots were also present on whole body. Bony tenderness was present over sternum and shin. Rest of the examination was unremarkable.

Investigations Done Revealed:

HB:8.0g/dl,TLC:**130000**cells/mm^3,DLC:polys 16 lymphos80%, platelet: 50000/mm^3, blasts **8% Bone Marrow Biopsy Report**: H&E stained section of bone marrow biopsy showed bony trabeculae enclosing marrow spaces. The marrow spaces are cellular however many areas show clusters of mononuclear cells with high N: C ratio, large vesicular nuclei and 0-1 nucleoli. There is suppression of erythroid and myeloid series. Occasional megakaryocytes are seen.

Immunohistochemistry: positive for CD10, CD19, CD20, PAX-5, Cd79a, CD34. Negative for CD3, CD5, MPO, Cd47.

Impression: CALL A positive acute B lymphoblastic leukemia with myelofibrosis.

Flowcytometry:17% blasts; Dim to moderate expression of CD79a(63%),TdT(28.1%),CD34(37.4%),HLA-DR(32%). Co expression of CD10,CD19(63.2%).

Negative for CD3,CD7 ,CD5,cCD3,MPO,CD 13,CD33,CD117, Cd14

Impression:CALL A positive B-cell acute lymphoblastic leukemia.

Chromosomal Analysis(FIG 3.) :GTG BANDING: 46,XX, t(9;22)(q34;q11.2)[5] suggestive of BCR-ABL Translocation.(FIG 3.)

It was concluded that the diagnosis in this child was CALL A positive B-cell acute lymphoblastic leukemia with Ph chromosome(BCR-ABLchromosomal translocation)making it a high risk B-ALL. Child was started on B-ALL high risk protocol chemotherapy (AIIMS Delhi) .Child was also given

Imatinib@350mg/m2/day.

DISCUSSION

Acute lymphoblastic leukemia (ALL) is the most common childhood malignancy all world over[1]. Its incidence is approximately 3-4 cases per 100,000 children below 15 yr of age[2]. . Recent advances with effective chemotherapy in last three decades has changed ALL in children from a universally fatal disease to a curable one in 85% of children[1]. ALL is a heterogeneous group of disorders that can be subtyped by morphology, immunophenotyping, cytogenetic study, and molecular techniques[3]. The Philadelphia chromosome (Ph) is the hallmark of chronic myeloid leukemia and also occurs in approximately 5% of children and 20% of adults with ALL[1].

This reciprocal translocation juxtaposes the BCR gene on chromosome 22 with the ABL gene on chromosome 9, producing a fusion gene that encodes the BCR-ABL fusion protein[1]. Ph-positivity in ALL is associated with aggressive disease and has been shown to be a poor prognostic factor, especially in children[3].

Our 7 year old female child presented with hepatosplenomeg aly, generalized lymphadenopathy, petechial, purpuric rash with prolonged fever.TLC was above a lakh with 80% lymphocytes with 8% blasts in PBF.Bone marrow biopsy , immunohistochemistry and Flowcytometry was suggestive of CALL A positive B- Acute lymphoblastic leukemia. Chromosomal analysis with GTG banding showed BCR-ABL translocation. Thus child was diagnosed with CALL A positive B- Acute lymphoblastic leukemia with Ph chromosomal translocation making it a high risk B-Acute lymphoblastic leukemia. Child was started on B-ALL high risk protocol chemotherapy (AIIMS Delhi) .Child was also given Imatinib@350mg/m2/day.

CONCLUSION

A rare case of 7 year old girl with CALL A Positive B- acute lymphoblastic leukemia with BCR-ABL translocation.

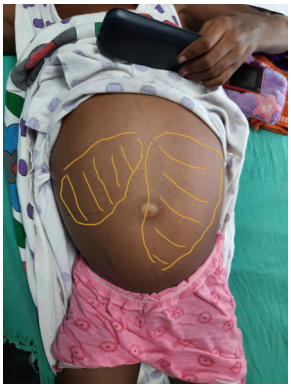

Fig 1. Hepatosplenomegaly In Child

Fig 2. Hepatosplenomegaly With Protruded Abdomen

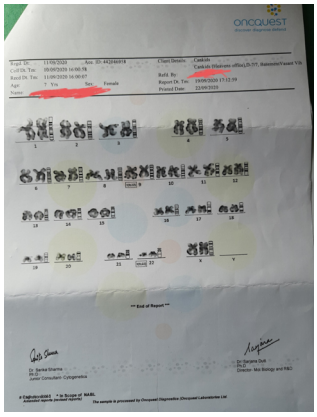

Fig 3. Chromosomal Analysis :gtg Banding.
Showing 46,xx,t(9;22)(q34;q11.2)[5] ;bcr- abl translocation

REFERENCES

1. Robert Kliegman M, Bonita Stanton F,Nina Schor F,et al. Nelson Textbook of Paediatrics .2016;20:2212-2213
2. Paul Vinod K,Bagga Arvind. Ghai Essential Pediatrics.2013; 8:599-605.
3. Sugapriya D, Preethi S, Shanthi P,et al. BCR-ABL Translocation in Pediatric Acute Lymphoblastic Leukemia in Southern India
Indian J Hematol Blood Transfus. 2012 Mar; 28(1): 37–41.
4. Arya LS. Acute lymphoblastic leukemia: current treatment concepts. Indian Pediatr. 2000;37:397–406.
5. Bhutani M, Kochupillai V, Bakshi S. Childhood acute lymphoblastic leukemia : Indian experience. Indian J Med Paediatr Oncol. 2004;20:3–8