Philadelphia Chromosome Positive B-lymphoblastic Leukemia in an Infant

Sir,

Acute Lymphoblastic Leukemia (ALL) in infancy is a rare entity with reported incidence of 2.5-5% of total childhood ALL.[1] It usually presents with organomegaly, hyperleukocytosis, central nervous system (CNS) involvement and B-cell phenotype. Acquired mixed lineage leukemia (*MLL)* gene rearrangement on chromosome 11q23 is the most observed cytogenetic abnormality in infantile ALL with an incidence of ~80%.[2] The Philadelphia (Ph) chromosome positive B-lymphoblastic leukemia (B-ALL) is uncommon in childhood (<5%) and exceptionally rare in infants.[3] Here, we report a case of infantile B-ALL with presence of Ph chromosome and absence of MLL gene rearrangement.

An 11-month infant boy presented with complains of fever and irritability. On examination, he had cervical lymphadenopathy, and hepato-splenomegaly. Complete blood count (CBC) showed haemoglobin (Hb) 8.7gm/dl, total leucocyte count (TLC) 10.24 x 10^9 /L, and platelet count 38 x 10^9/L with 22% blasts. Diagnosis of B-ALL was confirmed by flow cytometry, which revealed 82% blasts, positive for TdT, CD19, CD79a and CD10 immunostains. Karyotype showed presence of Ph chromosome in 10 out of 20 analysed cells. Fluorescent *in situ* hybridisation (FISH) results were consistent with presence of BCR/ABL1 fusion signals in 36.7% of nuclei. However, MLL gene rearrangement and ETV6/RUNX1 were not found. Polymerase chain reaction (RT-PCR) showed BCR-ABL1 p210 mRNA transcript in 32% of total ABL1. The diagnostic cerebrospinal fluid (CSF) showed white cell count of 33/ul with 65% blast cells. Hence, the final diagnosis of B-ALL with Ph chromosome and central nervous system (CNS) involvement was established.

The case was discussed in Tumour Board. Based on poor anticipated response to chemotherapy, allogenic hematopoietic stem cell transplant in first remission (CR1) was proposed. The family was counselled for the limitation of transplant facility in our settings; and referral to transplant centre was advised for the curative treatment. However, the family continued to follow with us, where palliative care was offered; but the child died due to sepsis within 4 weeks of diagnosis.

ALL in infants is an aggressive disease with higher chances of treatment failure; and it exhibit MLL gene rearrangement as a hallmark cytogenetic abnormality.[4]Ph chromosome is a disease defining feature of chronic myeloid leukemia (CML), and it is uncommon (3-5%) in childhood ALL and exceptionally rare in infants with ALL. Moreover, more than 90% of childhood Ph+ ALL patients have a 190-kDa BCR-ABL fusion protein; whereas, we found p210 fusion protein in our case, that is commonly described in CML.[5] This unique cytogenetic finding and lack of MLL gene rearrangement in our case, warrants its reporting for awareness and therapeutic relevance.

CONFLICT OF INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
HK: Design of work, manuscript writing.
NM: Data collection, manuscript writing.
NJ: Concept, proofreading, submission.

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Hadia Khanani[1], Neelum Mansoor[2] and Naeem Jabbar[2]

[1]Department of Pediatric Haemalogy Oncology, The Indus Hospital, Karachi, Pakistan
[2]Department of Haematology, The Indus Hospital, Karachi, Pakistan

Correspondence to: Dr. Naeem Jabbar, Department of Haematology, The Indus Hospital, Karachi, Pakistan
E-mail: drnaim2005@hotmail.com

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