Philadelphia Chromosome Positive Chronic Myelogenous Leukemia in A Child: A Case Report

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Abstract Philadelphia chromosome (Ph¹)-positive Chronic Myelogenous Leukemia (CML) in a child below the age of 3 years is extremely rare. We have reported such a case in a 3 year old male child. Peripheral blood smear revealed features of CML and karyotypic study showed (Ph¹) positivity. Biologic behaviour and prognosis are similar to that of adult-type of CML.

Keywords Adult-type · CML · Karyotype · Ph¹-positive

Introduction

Philadelphia chromosome (Ph¹)-positive Chronic Myelogenous Leukemia (CML) in childhood is rare, constituting about 3% of childhood leukemias [1]. In children below 5 years, it is even rarer. Only modicum of information is available in the form of case reports [2, 3]. Diagnosis of such cases can be made from peripheral blood smear examination, supported by karyotypic study. Though biologic behaviour and prognosis are identical to that of adult type, we are reporting this case because of its extremely uncommon incidence [1, 2].

Case Report

A 3 year old male child presented with fever, hepatosplenomegaly of 3 months duration. Hematological investigations revealed: hemoglobin—6.9 gm/dl, total leukocyte count (TLC)— $110 \times 10^9/l$, total platelet count (TPC)—

$620 \times 10^9/l$, differential count (DC)—neutrophil—29%, eosinophil—05%, monocyte—06%, lymphocyte—11%, myelocyte—14%, metamyelocyte—15%, blast—05% (Fig. 1). Fetal hemoglobin level was normal. Karyotypic study revealed Philadelphia Chromosome positivity (Fig. 2). A diagnosis of Ph¹-positive type of CML was made and patient was sent to the oncologist where he was advised chemotherapy with imatinib. He is under follow-up since the last 2 years, and is responding well to treatment.

Discussion

CML in childhood presents as one of the two clinically distinct syndromes, i.e., adult-type CML (ATCML), which is Ph¹-positive, and juvenile CML, also known as Juvenile Myelomonocytic Leukemia (JMML), which is Ph¹-negative [4]. Though ATCML or Ph¹-positive CML is more common in children, it is very rarely encountered below the age of 5 years, whereas JMML is more common [1]. In children, this disorder predominates in females, whereas in adults it is more frequent in males [2].

Diagnosis of such cases in chronic phase can be made by hematological investigations [5]. However, in children below 5 years, the possibility of JMML should be ruled out, for which a fetal hemoglobin estimation and karyotypic analysis are essential.

Clinical presentation, diagnostic criteria, biologic behaviour and prognosis are same as conventional ATCML with a few exceptions [1, 2]. Splenomegaly, hepatomegaly, hyperleukocytosis, anemia and leukostatic signs and symptoms are more frequently encountered in children [2]. According to a study by Sokal et al., percentage of circulating blasts and spleen size are the most significant predictors of long term survival [5, 6].

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Fig. 1 Microphotograph showing peripheral blood picture of CML

Conclusion

Ph¹-positive CML in a child below 5 years of age though extremely rare is possible.

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Fig. 2 Photograph of karyotypic study showing Philadelphia-chromosome positivity