Case Report

Congenital Leukemia in Down Syndrome

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Introduction

Congenital leukemia is a rare condition and often associated with fatal outcome. Most of the neonatal cases reported have acute non-lymphoblastic leukemia, in contrast to the predominance of acute lymphoblastic leukemia found in later childhood. Congenital leukemia is occasionally associated with number of congenital anomalies and with chromosomal disorders such as Down syndrome. Subtle cytogenetic abnormalities may occur more commonly in the affected infants and their parents, when studied with newer cytogenetic techniques. Inherent unstable hematopoieses resulting from chromosomal aberration in children with Down syndrome can present with transient myeloproliferative disorder, mimicking leukemia which undergoes spontaneous recovery. Only few cases of congenital leukemia with Down syndrome have been reported in the literature. We report a 02 days old newborn with features of Down syndrome, presented as congenital leukaemia.

Case Report

A term female born to 38 years old mother of nonconsanguineous marriage at Pakistan Railway & General Hospital. It was a normal vaginal delivery with no history of cytotoxic drug intake or exposure to radiation during antenatal period. Special emphasis was given to elicit the history of maternal fever, rash or lymphadenopathy in the mother in the first trimester to rule out TORCH infection. The baby had breech delivery, cyanosis at the time of birth, delayed cry and difficulty in breathing. Physical examination revealed features of Down syndrome (mongoloid facies, epicanthic folds, hypotonia, and simian crease in hands) purpuric spots were present all over the body and mild pallor was also noticed. Liver was just palpable and spleen 3 cm below costal margin. No lymph nodes were palpable. A clinical diagnosis of Down syndrome was made.

Peripheral smear revealed normocytic normochromic RBC morphology with slight macrocytosis. Total white cell count was 97000/cmm with blasts 78%, myelocytes (09%) metamyelocytes (04%) and promyelocytes (03%) Platelets were reduced (62000/ul) Bone marrow aspiration was done from tibia which showed markedly hypercellular smears and fragments. Myeloblasts were 85%, mostly with low N/C ratio and fine chromatin pattern with prominent nucleoli. Majority of blast cells were positive for Sudan black B staining. Some of them also had cytoplasmic granules. Maturing cells of myeloid series such as promyelocytes and myelocytes were also present. The case was labeled as Acute Myeloid leukaemia (AML M1). Cytogenetic studies and serial blood counts were suggested. The baby was shifted subsequently to Pakistan Institute of Medical Sciences oncology department for further management.

Discussion

Leukemia is classified as congenital when diagnosed at birth and neonatal during the first month of life. It is described as leukemia of infancy after one month of life. However the diagnosis of congenital leukemia has been applied to those cases developing symptoms within first 3-6 weeks of life. Congenital leukemia is a rare disease and the prognosis for neonates is poor as most of them do not survive beyond infancy.

The diagnosis of congenital leukemia is more stringent than the adult counterpart due to the labiality of infants hemopoietic system, which on exposure to stressors can mimic leukemia. The differential
diagnosis of congenital leukemia includes leukemoid reactions, congenital infections, severe erythroblastosis and neonatal neuroblastoma. Though leukemoid proliferations that mimic congenital leukemia can be seen in Down syndrome, as transient myeloproliferative disorder, congenital leukemia in the setting of trisomy have been reported in few cases as a rare entity. The following criteria must be fulfilled for the diagnosis of congenital leukemia: Proliferation of immature white cells; Infiltration of these cells into bone marrow; Absence of any other disease that can cause leukemoid reaction mimicking leukemia i.e. congenital syphilis; Blood group incompatibility and TORCH infection. Our child fulfilled the criteria i.e. evidence of blasts in peripheral smear and infiltrate of blasts in the hemopoietic tissue (bone marrow). Some authors consider additional criteria to be a requisite for the diagnosis of congenital leukemia i.e., the absence of constitutional disorders that may be associated with unstable hematopoiesis such as trisomy 21. This condition called as transient myeloproliferative disorder in Down syndrome has unique characteristics of spontaneous remission with complete recovery.

Cellular morphology, immunophenotyping, and chromosomal studies differentiate acute lymphoblastic from acute myeloid leukemia in newborns. FAB classification based on cell morphology reveals that the most common subtype in infantile and neonatal acute non lymphoblastic leukemia is the monocytic variety.

The course of congenital leukemia is one of rapid deterioration and death from haemorrhage and infection. While diagnosing congenital leukemia the condition of transient myeloproliferative syndrome should always be kept in mind as the later entity is associated with complete remission.

Reference
12. Ridgway D, Benda GI, Magenis E, etal. Transient myeloproliferative disorder of the Down type in the newborn infant. AJDC; 2002; 144; 1117-1119.