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Case Report

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NEONATAL ANEMIA – COULD IT BE CONGENITAL LEUKEMIA?

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ABSTRACT

Anemia in neonates has diverse causes, among which congenital leukemia is the least common. Congenital leukemia presents in indiscrete fashion and poses diagnostic dilemma. We present a newborn who was admitted to Neonatal Intensive Care Unit immediately after birth for respiratory distress and intense pallor. Routine evaluation for anemia revealed presence of blasts in peripheral smear, confirmed later on by bone marrow aspiration. We present a rare case of congenital leukemia who presented to us only with anemia as the exclusive finding of leukemia with no other common clinical features like organomegaly.

KEYWORDS: Congenital Leukemia, Term Neonate, Anemia, Peripheral Smear.

INTRODUCTION

Anemia in the neonatal period is often a complex problem. The common causes of neonatal anemia are Rhesus factor (Rh) and blood group system (A, B, AB, and O) incompatibility, hemorrhagic disease of newborn, hemoglobinopathies, and TORCH (toxoplasmosis, rubella, cytomegalovirus, herpes virus) infections.[1] Approximately only 200 cases of congenital

leukemia have been reported in literature till date.[2] Congenital Leukemia (CL) is a rare cause of anemia in newborns. The most common clinical presentations of congenital leukemia include pallor, leukemia cutis, hepatosplenomegaly, bleeding manifestations, sepsis, periodic apnea or respiratory distress.[3] Neonates with this condition have poor prognosis, with the 6-month survival rate being only one third despite aggressive chemotherapy.[4] We report a case of neonate who presented on the first day of life with intense pallor and respiratory distress.

Case Report

A term male baby born to Non consanguineous couple by Emergency LSCS, indication being severe oligohydramnios, was admitted to neonatal intensive care unit (NICU) with Respiratory distress. Mother was 20 years old and primi with no h/o of steroid intake in the antenatal period. No h/o of ante partum hemorrhage. Mother's blood group is B positive. On examination baby was active, with normal cry, normotheric, but significant pallor was present. No obvious external congenital anomalies were seen. Birth weight was 2.5 kg, Length- 49cm, Head circumference-34cm. Heart rate was 120/min. Respiratory rate was 70/min with minimal retractions. Downe's score was 3 and his Blood pressure was 90/40mmHg. He saturated 98% with 2-3 litres of oxygen. No hepatosplenomegaly, other systems on examination were normal.

He was evaluated for pallor and respiratory distress. His investigations are shown in Table1

Table 1: Laboratory Investigations

S. NO	INVESTIGATION	RESULTS
1	Hemoglobin	9.4 gm per dl,
2	WBC count	70000/ cubic mm
3	Platelets	90000/ cubic mm
4	Differential Count	Myeloblasts-80%, Monoblasts-15%, Neutrophils-5%, Eosinophils-1%, Lymphocytes-nil
5	Peripheral Smear	RBC morphology showed Marked anisopoikilocytosis with hypochromia, macrocytes, elliptocytes, and ovalocytes. Neutrophils showed dysplastic features like A) ring nucleus B) pseudo pelger anomaly.
6	CRP	2mg/L
7	Blood Culture	No Growth
8	Blood Group	B positive
9	Direct Coombs Test	Negative
10	LFT, RFT&Electrolytes	Normal limits
13	TORCH Serology	Normal
14	Karyotyping	46,XY
15	Serum Calcium	10.3mg/dl

16	Serum Phosphorus	3.0 mg/dl
17	2D ECHO	Mild Pericardial Effusion
18	Bone Marrow	Confirmed the diagnosis of Acute myelo monocytic leukemia
19	Lumbar Puncture	Within Normal Limits, No malignant cells
20	X-Ray Chest(Fig 6)	Cardiomegaly
21	USG Abdomen	Normal

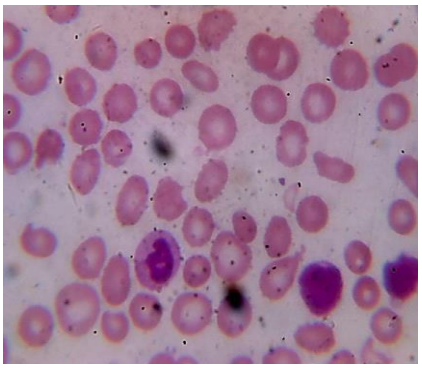
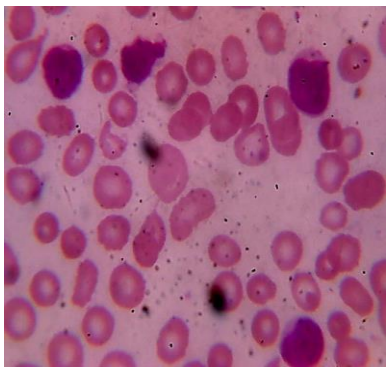
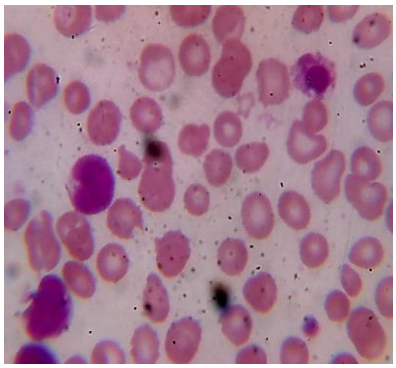

Fig1, 2 & 3: Anisopoikilocytosis, nucleated RBC's, myeloblasts and monoblasts in peripheral smear.

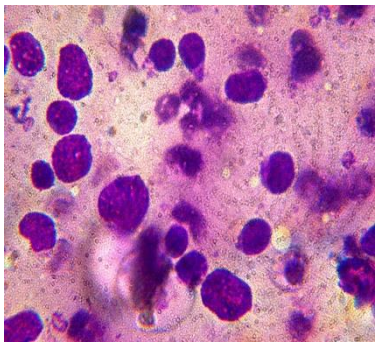
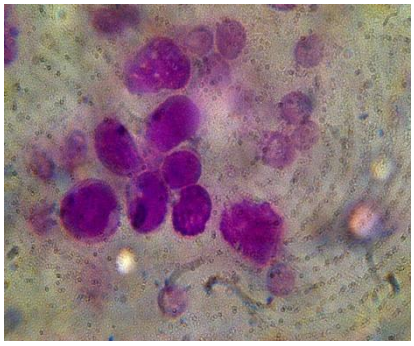
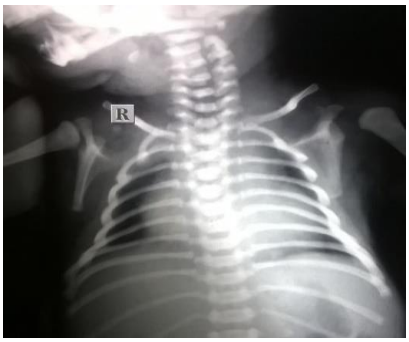

Fig 4 & 5 Bone Marrow smear showing myeloblasts and monoblasts and Fig 6 X-Ray chest showing cardiomegaly.

Baby was managed symptomatically with 2-3 lit of O2 inhalation, IV fluids and IV antibiotics. His respiratory distress settled in 24 hours. Since the bone marrow (Fig 5 & 6) confirmed the diagnosis of AML (M4) on 2nd day, baby was referred for chemotherapy to Cancer Institute. Baby was started on aggressive alkaline diuresis and chemotherapy there. Baby was treated for a week, but succumbed to the disease by 10th day of life despite treatment.

DISCUSSION

Congenital leukemia(CL) is a rare neonatal disease with an incidence of 4.7 cases per million births, which develops in utero and usually is diagnosed at birth or within one month of life

because of the rapid doubling time of leukemic cells.[5,6] Congenital leukemia is more common among males than females (2:1) infants and among Caucasian than (1.6:1) African American infants.[7] Most commonly congenital leukemia is of myeloid origin in contrast to general pediatric leukemia, which is usually lymphoid in origin.[8] The acute myelomonocytic (FAB M4) and acute monocytic (FAB M5) leukemia are the commonest subtypes among them.[9]Genetic syndromes such as Down, Noonan, and Turner syndromes, as well as trisomy 9, predispose to congenital leukemia.

CL has no pathognomonic findings. The proposed diagnostic criteria for CL include: I) Presentation in the first 4 weeks of life; II) Proliferation of immature myeloid, lymphoid or erythroid cells; III) Infiltration of these cells into non-hematopoietic tissues; IV) Absence of other diseases which may explain this proliferation.[10]

Clinical manifestations of CL are non-specific and diverse. The most common clinical findings include hepatosplenomegaly, leukemia cutis, petechiae, ecchymosis, or signs of sepsis. CL poses diagnostic challenge when the newborns present only with anemia without any organomegaly or leukemia cutis. In such cases, routine workup for anemia can guide the clinician in reaching the final diagnosis.

In our case the most common causes of anemia in newborn like hemolytic anemia and blood loss were ruled out by doing reticulocyte count and serum bilirubin and with appropriate history. In order to rule out anemia of underproduction, bone marrow aspiration cytology was planned. In the presence of both anemia and leukocytosis in our case, intra uterine infections and sepsis[11,12] were ruled out by doing TORCH profile, routine serology and blood culture.

One another close differential diagnosis that needs to be considered is Transient Myeloproliferative Disorder (TMD) of the newborn, seen usually in association with Down's syndrome. They often have associated transient polycythemia and thrombocytosis, which were not seen in this case. Since the prognosis of TMD is good, to rule out chromosomal disorders, karyotyping was done which turned out to be normal.

Examination of the peripheral blood smear is an inexpensive but powerful diagnostic tool for a variety of hematologic disorders. The smear offers a window into the functional status of the bone marrow, the factory producing all blood elements. In some cases, the peripheral

smear alone is sufficient to establish a diagnosis. [13] In our case also peripheral smear established the diagnosis which was confirmed by bone marrow as Acute Myelomonocytic Leukemia (M4).

Prognosis of CL is dismal. Despite chemotherapy survival rates in Congenital AML is just 23% at 2 years.

CONCLUSION

Even though congenital leukemia is a very rare cause of anemia in newborn, congenital leukemia should be considered in the differential diagnosis of any neonate presenting with significant anemia.

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