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Case Report

An Incidental Case of Transient Erythroblastopenia of Childhood

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ABSTRACT

We highlight a pediatric case of Transient Erythroblastopenia of Childhood (TEC) and compare with published reports and contrast TEC with other causes of anemia, most notably Diamond Blackfan Anemia (DBA). Secondly, many of the business. The development of anemia may be subtle, and TEC is a diagnosis of exclusion. The broad differential diagnoses of anemia include decreased RBC production (erythropoiesis) or increased RBC destruction (hemolytic anemias). Decreased RBC production includes viral suppression and bone marrow failure (congenital or acquired).

Keywords: Hepatosplenomegaly; Anemia; Erythroblastopenia; Echovirus

INTRODUCTION

Transient Erythroblastopenia of Childhood (TEC) is characterized by a temporary cessation of erythrocyte production with continued production of white blood cells and platelets in previously healthy children. This is the most common Pediatric Pure Red Cell Aplasia (PRCA), an isolated anemia with reticulocytopenia [1]. The etiology is unknown, yet suspected causes of Transient Erythroblastopenia of Childhood (TEC) include preceding viral illnesses (e.g. Parvovirus B19, Human Herpesvirus Type 6, Echovirus 11), serum inhibitors against erythroid progenitor cells, and immune mediated suppression of erythropoiesis. In order to test and isolate offending viral pathogens, PCR testing is commonly performed [2].

Transient Erythroblastopenia of Childhood (TEC) usually affects infants with a median age of 18-24 months, with a range of 1 month to 6 years of age with a slight male predominance, but no racial predilection [3]. The Hemoglobin (Hb) levels range between 6-8 g/dL and reticulocytopenia is due to transient suppression of red blood cell (RBC) production. We highlight a pediatric case of TEC and compare with published reports and contrast Transient Erythroblastopenia of Childhood (TEC) with other causes of anemia, most notably Diamond Blackfan Anemia (DBA).

CASE PRESENTATION

Our patient was a healthy 12 month old African American male with no significant past medical history who presented for a well-child checkup. Screening CBC and lead level were obtained. His vital signs were temperature 36.6°C, pulse 136, and respiratory rate 28. The physical exam was significant for mild conjunctival pallor, his height was in the 89th percentile, weight in 42nd percentile, and he had no abnormal facies, digit abnormalities, or hepatosplenomegaly.

Family history was negative for anemia, bleeding disorders, or hemoglobinopathies. He had a history of an antecedent viral illness consisting of vomiting and diarrhea 2 weeks prior to presentation. One day later, his Hb was reported at 5.5 g/dL, which prompted hospitalization.

Laboratory analysis revealed Hb 5.5 (g/dL), MCV 76 (fL), reticulocyte count 1.7%, and platelet count 594 × 109/L. Antibody titers were negative f or Parvovirus B19, EBV, and CMV, and peripheral smear showed normocytic, normochromic anemia (Figures 1 and 2).

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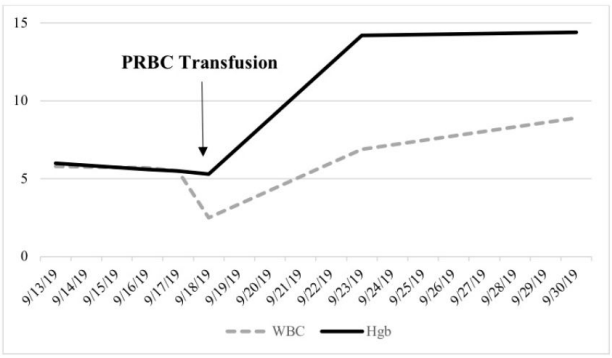

Figure 1: White blood cell [WBC (103/mcL)] and hemoglobin [Hb (g/dL)] levels are shown over time.

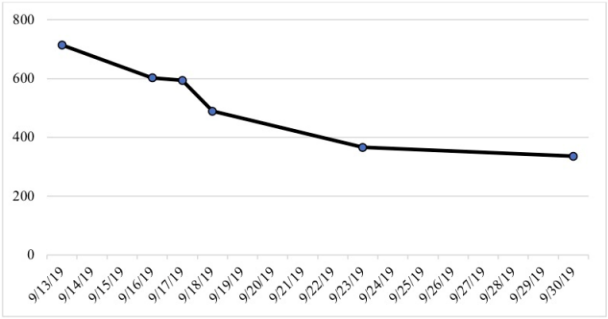

Figure 2: Platelet counts (109/L) are shown over time.

The patient's vital signs remained unchanged. Because of the persistent reticulocytopenia, the patient was transfused PRBC (15 cc/kg), and his Hb rose to 14.2 g/dL. Initially, the patient presented with mild thrombocytosis. However, the platelet number returned to normal over time. Platelet levels may either be increased or decreased in Transient Erythroblastopenia of Childhood (TEC). The constellation of recent viral illness, lab results, and clinical resolution of symptoms led to the diagnosis of Transient Erythroblastopenia of Childhood (TEC). The patient was subsequently discharged, and a follow-up appointment was made with Hematology.

DISCUSSION

A recently published Canadian retrospective study included 36 cases of Transient Erythroblastopenia of Childhood (TEC) followed over 30 years. The patients met several diagnostic criteria including a hemoglobin level two standard deviations lower than that matched for age, inadequate reticulocyte compensation for the degree of anemia, and no other etiology of anemia such as blood loss, malignancy, nutritional deficiency, or hemolysis. Of those 36 patients, the median age of diagnosis was 19 months with slight predilection for males (56%). Interestingly, 4 out of the 36 cases (11%) had incidental finding of Transient Erythroblastopenia of Childhood (TEC) and presented for wellness checkup or an uncomplicated fracture. The majority of cases (89%) presented for symptoms of anemia including pallor, fatigue, and anorexia [4].

Fifty percent of the cases had preceding upper respiratory infection symptoms (cough, rhinorrhea), diarrhea, or fever. On laboratory analysis, all 36 patients had a decrease in hemoglobin with a median of 4.4 g/dL and majority displayed Absolute Reticulocyte Count (ARC) <5%. Sixty-four percent of cases had a platelet count greater than 400 × 109/L. An unspecified majority of the cases had a bone marrow biopsy, an invasive procedure, with findings that were consistent with pure red cell aplasia (PRCA) [4].

Usually Transient Erythroblastopenia of Childhood (TEC) is a mild, self-limiting anemia and a bone marrow biopsy is routinely not indicated and therefore was not done in our patient. In the same Canadian retrospective study, 26 of the 36 patients (72%) were transfused Packed Red Blood Cells (PRBC) and 10 (28%) received supportive care. The time to normalize the hemoglobin was 5 weeks. All 36 patients were closely followed up for a median period of 15 years for any sequelae or complications and there were no reports of any recurrence of Transient Erythroblastopenia of Childhood (TEC) symptoms or progression to another hematologic disorder [4].

The development of anemia may be subtle, and Transient Erythroblastopenia of Childhood (TEC) is a diagnosis of exclusion. The broad differential diagnoses of anemia include decreased RBC production (erythropoiesis) or increased RBC destruction (hemolytic anemias). Decreased RBC production includes viral suppression and bone marrow failure (congenital or acquired). Hemolytic anemias include RBC membrane disorders, cytoskeletal defects (e.g. hereditary spherocytosis), enzymopathies (e.g. G6PD) or hemoglobinopathies (e.g. sickle cell disease).

Another entity to consider in particular is Diamond-Blackfan Anemia (DBA), a congenital erythroid aplasia that presents in infancy, as opposed to Transient Erythroblastopenia of Childhood (TEC), which is most commonly acquired after a viral illness. Twenty-five percent of patients with DBA are linked to a genetic mutation involving ribosomal protein 19 (RPS19) [5]. Activation of tumor suppressor proteins such as p53 may lead to problems with erythropoiesis [6]. Forty-five percent of patients with DBA are familial, with autosomal dominant inheritance, unlike Transient Erythroblastopenia of Childhood (TEC) [7].

Ninety percent of patients are diagnosed with DBA within the first year, with thirty-five percent diagnosed in the first month of life. In contrast, Transient Erythroblastopenia of Childhood (TEC) is usually diagnosed at a median age of 18-24 months, with a range of 1 month to 6 years [3]. There is also no gender predilection in DBA, whereas Transient Erythroblastopenia of Childhood (TEC) has a slight propensity for males. DBA is characterized by a macrocytic, normochromic anemia with reticulocytopenia, normal bone marrow cellularity, and decreased or absent erythroid precursors [8]. Other cell lines such as leukocytes and thrombocytes are usually not affected. About thirty to fifty percent of patients with DBA will develop physical exam features that involve the face and upper extremities including microcephaly, short stature (<5%), delayed growth (30%), and triphalangeal thumbs [7].

CONCLUSION

In summary, Transient Erythroblastopenia of Childhood (TEC) is a diagnosis of exclusion and is characterized by a self-limiting decrease in hemoglobin and reticulocyte count due to transient bone marrow suppression of RBCs. This case highlights that the presentation may be as subtle as conjunctival pallor only and at times can be entirely asymptomatic. Management of Transient Erythroblastopenia of Childhood (TEC) ranges from watchful waiting with adequate reticulocyte response if hemodynamically stable or a single PRBC transfusion with supportive care. Finally, clinicians should keep broad differential diagnoses of anemia and must consider ordering reticulocyte count for evaluation of anemia. Differentiating between Transient Erythroblastopenia of Childhood (TEC) and DBA can occasionally be difficult and may ultimately rely on genetic testing for DBA.

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ETHICS APPROVAL AND CONSENT

The authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work. Verbal informed consent was obtained from the patient's family for their anonymized information to be published in this article.

DECLARATION OF CONFLICTING INTERESTS

The authors declared no potential conflicts of interest concerning the research, authorship, and publication of this article.

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