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CASE REPORT

Pure Red Cell Aplasia in Systemic Onset Juvenile Idiopathic Arthritis

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Abstract Common causes of anemia in juvenile idiopathic arthritis are anemia of chronic disease and iron deficiency. We report a 4 year old boy with biopsy proven systemic onset juvenile idiopathic arthritis and severe anemia. Bone marrow aspiration revealed pure red cell aplasia without evidence of hemophagocytosis. This rare, unexplained but well known entity responded to corticosteroids.

Keywords Systemic onset juvenile idiopathic arthritis · Pure red cell aplasia

Introduction

Anemia in systemic onset juvenile idiopathic arthritis (SOJIA) is mostly attributed to the anemia of chronic disease or iron deficiency [1]. Though rare, pure red cell aplasia (PRCA) is a well known entity associated with juvenile idiopathic arthritis (JIA) and was reported as early as 1978 [2]. Two adult case reports have been published from India [3, 4]. We report a child with SOJIA and severe anemia due to PRCA; an uncommon presentation of a common illness is worth mentioning.

Case Report

A 4 year old boy had complaints of fever and joint pain of right knee of 4 months duration. On examination, he had arthritis of right knee joint and polyarthralgia of other large joints. A quotidian fever >38.4°C was documented for about 3 weeks especially in the evening hours. During each febrile episode, evanescent non pruritic rashes were noticed more on the trunk. He had pallor, generalized lymphadenopathy and hepatosplenomegaly as well. Other systems including the eye were within normal limits.

Initial investigations were as follows: Hb 4 g/dL, total count 32,000 $\times$ 10^3/ml, platelet count 950 $\times$ 10^6/ml and ESR 150 mm in first hour. Peripheral smear showed normocytic normochromic anemia, neutrophilic leukocytosis and thrombocytosis. Supravital staining showed absent reticulocytes. Hence, a bone marrow aspiration was done which revealed cellular marrow, absent erythroid precursors with hyperplastic myelopoiesis and megakaryopoiesis with no evidence of hemophagocytosis. The findings were consistent with PRCA.

Apart from raised serum ferritin (4943 ng/ml), iron studies were normal. A synovial aspirate gave sterile turbid fluid with polymorphonuclear leukocytosis and increased protein. Synovial biopsy showed subsynovial mononuclear infiltration with pannus formation; the findings were consistent with rheumatoid arthritis with activity. ANA, RF, ASO, Coombs test, HIV, stool for occult blood and Tuberculin test were negative. C3, hepatic enzymes and renal function tests were normal and blood culture was sterile.

The child was put on Naproxen but due to inadequate response, oral prednisolone 1 mg/kg/day was added. Over one month, the child got relieved of his symptoms. A packed cell transfusion was also given. Methotrexate and folinic acid were added and Naproxen gradually withdrawn. We plan to stop prednisolone within a few weeks. A repeat bone marrow aspiration showed normal erythroid picture. He is being closely followed up.

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Discussion

Anemia of chronic illness is usually mild (7–9 g/dl); our child had severe anemia of 4 g/dl. Apart from an increase in the acute phase reactant ferritin, iron studies done on blood and bone marrow were perfectly normal. Hence, though common, both anemia of chronic disease and iron deficiency anemia as a cause for anemia in this case were ruled out.

There are reports of PRCA associated with JIA [5, 6]. The causes postulated are diverse. Serum from patients with JIA was shown to inhibit colony formation by normal erythropoietic progenitor cells cultured in vitro [7]. In one report, an IgG inhibitor of autologous erythroid colony-forming and burst-forming unit growth in vitro was identified in the serum of one patient [8]. This report also points that PRCA may be another extra articular manifestation of JIA and should be considered when severe anemia develops in the absence of blood loss or hemolysis.

A possible external trigger for JIA is parvovirus B19 viral infection. Clear association of parvovirus B19 to erythroid aplasia is known. Parvovirus B19 as a common link to JIA and PRCA is well documented in one case report [9]. However, in our child, bone marrow aspirate did not show the pathognomonic feature of parvovirus B19 infection viz. scattered giant pronormoblast.

Hypoplastic crises in some instances may represent a virus associated hemophagocytic syndrome. Clinical features, laboratory and bone marrow studies in our child showed no evidence of hemophagocytic syndrome.

Several drugs used in the treatment of JIA can secondarily lead to erythroid aplasia. Studies depicting fenbrufen, sulphasalazine and d-penicillamine as major culprits have been published [10, 11]. Even without any drug therapy, our child showed erythroid aplasia.

In all published case reports except one, SOJIA preceded PRCA. In one adult, PRCA preceded SOJIA by 16 months [12]. In our patient, PRCA occurred 4 months after the onset of SOJIA.

Around 15 case reports of PRCA associated with JIA have been published around the globe so far, of which pediatric cases come to less than five. We report this because though a well known entity, the association is rarely encountered especially in the pediatric population.

Conflict of interest None.

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