Case Report

Idiopathic autoimmune hemolytic anemia along with concomitant vitamin B12 deficiency in an adolescent girl: A rare occurrence

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Abstract

Vitamin B12 deficiency is seen in countries like India mainly because of predominantly vegetarian diet and is a significant health problem. Patients present with various neurological and hematological manifestations of megaloblastic anemia. In this case report, we present a 14-year-old girl child having a history of past blood transfusions and iron deficiency anemia currently presenting with severe anemia due to idiopathic autoimmune hemolytic anemia (AIHA) and later found to have concomitant vitamin B12 deficiency. On investigating, she had vitamin B12 deficiency, raised homocysteine and methylmalonic acid levels, positive Direct Coombs Test (DCT), and negative glucose-6-phoshphatase deficiency and osmotic fragility tests. Thyroid profile and tissue transglutaminase IgA (tTg-IgA) tests were negative. Antinuclear antibodies (ANA) and anti-double stranded DNA antibody (anti-dsDNA) serum immunoglobulin were also normal. Bone marrow showed megaloblastic anemia picture. Although AIHA and vitamin B12 deficiency anemia are not common, clinicians should have a high index of suspicion when patients present with hemolytic picture and severe megaloblastic anemia.

Keywords: Anemia, child, homocysteine, vitamin B 12 deficiency

Introduction

Vitamin B12 deficiency is seen in countries like India mainly because of predominantly vegetarian diet and is a significant health problem.[1] Patients due to poor intake of animal proteins present with various neurological and hematological manifestations of megaloblastic anemia. These manifestations include severe anemia, pseudomicroangiopathy, hemolysis to pancytopenia, and can be life threatening in approximately 10% of patients.[2] In this case report, we present a 14-year-old girl child having a history of past blood transfusions and iron deficiency anemia currently presenting with severe anemia due to idiopathic autoimmune hemolytic anemia (AIHA) and later found to have concomitant vitamin B12 deficiency. AIHA is a rare hematological disorder in the pediatric age group with mortality as high as 10%.[3] Moreover, it is difficult for primary-care physicians to diagnose and start specific treatment for AIHA in children.[4,5]

Case History

A 14-year-old girl child belonging to rural background presented to the Emergency Department of Pediatrics with breathlessness for the last 1 week. There was no other significant complaint. She had history of four blood transfusions in the last 3 years at a private hospital for similar complaints. She was taking only iron supplements for the last 1 year. On admission, she was

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pale looking with hemoglobin of 2.5 g/dL. She had a heart rate of 118 beats/minute; the rest of the vital examination was normal. She was put on oxygen inhalation and packed cells were transfused. She had a weight of 23 kg and was thin built. On systemic examination, she did not have any organomegaly and normal neurologic examination. Rest of the complete blood count showed platelet count = 30 × 109/L and total leucocyte count (TLC) = 1.3 × 109/L with the normal differential count. Mean corpuscular volume (MCV) was 101.8 fL and reticulocyte count was 8%. Further investigations included serum ferritin = 1589 ng/mL and lactate dehydrogenase (LDH) = 788 IU/L. Peripheral smear showed marked anisocytosis, that is, macrocytes, microcytes, and few schistocytes with hypochromasia. Liver and kidney function tests were normal except for elevated total bilirubin = 4.5 mg/dL (unconjugated). Coagulation profile was within normal limits. A Direct Coombs Test (DCT) was positive and given her history of blood transfusions, it was thought to be a hemolytic process secondary to AIHA. Further workup showed vitamin B12 deficiency = 50 pg/mL, serum folate = 19.0 ng/mL, methylmalonic acid level = 56.36 umol/L (mildly raised), and homocysteine levels = 53 μmol/L (raised). Glucose-6-phoshphatase deficiency and osmotic fragility tests were negative. Thyroid profile was normal and tissue transglutaminase IgA (tTg-IgA) test was within normal limits. Contrast-enhanced computed tomography (CECT) chest and abdomen were done to rule out malignancy and were normal. Antinuclear antibodies (ANA) and anti-double stranded DNA antibody (anti-dsDNA) serum immunoglobulin were normal. Upper gastrointestinal endoscopy was done to rule out pernicious anemia. Bone marrow showed megaloblastic anemia picture. A detailed workup ruled out infectious, malignant, and autoimmune causes of hemolytic anemia in index case, So the diagnosis of concomitant vitamin B12 deficiency with AIHA was made. Child was started on vitamin B12 injections daily along with oral prednisolone 1 mg/kg/day for 10 days. Hemoglobin levels showed sustained improvement. Vitamin B12 injections were gradually tapered initially to twice per week and currently child taken 1000 mcg every month along with oral prednisolone 10 mg/day (after tapering) and her last hemoglobin was 12.8 g%. DCT was negative after 5 months of therapy and clinically child was symptom free. The ethical permission was obtained from the Institution Ethics Committee for publishing this rare case report.

Discussion

Vitamin B12 deficiency is rarely symptomatic and is seen in patients who are predominantly consuming vegetarian diet as seen in index case (religious reasons) or do not have consumption of nonvegetarian diet either because of religious (seen commonly in our country) or the nonvegetarian diet is comparatively costlier.[1] Vitamin B12 deficiency can cause symptoms ranging from extreme lethargy, which may be because of anemia to neurological manifestations such as irritability and developmental delays. Peripheral smear may show macrocytosis and large abnormal neutrophilic forms with cytoplasmic vacuolations. However, pancytopenia is very rare finding, which was seen in our case.[1] Rarely, hemolytic picture is also described in peripheral smear due to vitamin B12 deficiency in literature such as marked anisocytosis, that is, macrocytes, microcytes, and few schistocytes with hypochromasia as seen in the present case with increased reticulocyte count.[1] "In a study of 201 patients with vitamin B12 deficiency, hemolysis was reported in 1.5% of cases and pancytopenia in 5%."[1] The cause of hemolysis seen in vitamin B12 deficiency may be due to infective erythropoiesis, postviral infection such as chickenpox or increased homocysteine levels as seen in our case. Increased homocysteine levels are shown to induce hemolysis by causing microangiopathy followed by ineffective erythropoiesis.[1] Raised levels of methylmalonic acid and homocysteine are required to confirm the diagnosis of vitamin B12 deficiency as seen in this case. Therefore, it is essential to ascertain these serum levels before starting the therapy.[6] High dose of vitamin B12 replacement is often essential in patients with a nutritional vitamin deficiency; however, management of anemia due to vitamin B12 deficiency with hemolysis is different from patients presenting with AIHA alone with a positive DCT3. Patients with true AIHA would not respond to vitamin B12 supplementation, unless they are treated with steroids as we did in our case.[2,7] So, differentiating these two conditions early on is important. Primary-care physicians should consider the possibility of coexistence of AIHA and megaloblastic anemia in their clinical practice if the hematological picture in a child is suggestive of both disorders.

Conclusion

Vitamin B12 deficiency is seen in countries like India mainly because of predominantly vegetarian diet and is a significant health problem. Although AIHA and vitamin B12 deficiency anemia are not common, primary-care physicians should have a high index of suspicion when patients present with hemolytic picture and severe megaloblastic anemia.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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