

A Case of Iron Deficiency Anemia Presenting As Pancytopenia

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Abstract

Iron deficiency anemia is the most prevalent form of malnutrition. Fifty-five years old males with hemorrhoids presented with pancytopenia. Hemoglobin 2.2 gm %, TC 1600/Cu.mm, Platelets 77,000 / cu.mm, MCV 69.7, red cell distribution width 44, Haematocrit 14.5, Serum ferritin 12 mcg/litre. The patient was diagnosed with iron deficiency anemia. Patient treated with Blood transfusion, Parental iron therapy. The patient improved clinically, and lab parameters also improved. In this case, we report an atypical presentation of severe iron deficiency.

Keywords – Pancytopenia, iron deficiency, thrombocytopenia

Introduction

Iron deficiency is the most prevalent form of malnutrition; 50% of anemia globally is attributable to iron deficiency (1). India is one of the countries with a very high prevalence of anemia worldwide. Almost 58 percent of pregnant women in India are anemic (2). Nutritional anemia is a significant public health problem in India, primarily due to iron deficiency (3, 4). In the World Health Organisation (WHO)/World Bank rankings, IDA is the third leading cause of DALYs lost for females aged 15–44 (2). Iron deficiency results from decreased intake, increased iron loss, or increased iron requirement (children and pregnancy) (2, 3, 4). The daily iron requirement for an Indian adult is 20 mg, of which 1 – 2 mg is absorbed (5). Iron deficiency anemia is usually associated with reactive thrombocytosis and normal or mild leukopenia (6 - 11). Pancytopenia in iron deficiency anemia is rare and is associated with severe iron deficiency anemia (6 -11). In this case, we report a Patient with severe iron deficiency presenting as pancytopenia, which was resolved with an iron replacement.

Case report

Fifty-five years old male with a known case of hemorrhoids on conservative treatment came with complaints of easy fatiguability and increased bleeding per rectum for the past month. He denied any other bleeding manifestations and breathlessness on exertion. He denied smoking and alcohol intake. On examination, he was pallor with koilonychia and balded tongue, not icteric, and no pedal edema. Pulse rate 89/min, blood pressure 130/70 mmHg. Systemic examination within normal limits. Investigations revealed Haemoglobin 2.2 gm %, TC 1600/Cu.mm, Platelets 77,000 / cu.mm, MCV 69.7, red cell distribution width 44, Haematocrit 14.5, Blood urea 20 mg/dl, S. Creatinine – 0.9 mg/dl, T. Bilirubin 0.8 mg/dl, SGOT 22, SGPT 28.

Serum ferritin 12 mcg/liter, Total iron binding capacity - 450 Mcg/dl, Serum Iron 25 mcg/dl. Peripheral smear microcytic hypochromic anemia, thrombocytopenia and leukopenia. Bone marrow erythroid hyperplasia with micro normoblastic proliferation, Myeloiderythroid ratio 1:2. Thus patient was diagnosed with iron deficiency anemia secondary to chronic blood loss. Treatment started with blood transfusion and parental iron therapy and subsequently treated for hemorrhoids. After two weeks patient's condition improved clinically, and laboratory values also improved (Hb- 8.5 gm%, Total count 4200/cu.mm, Platelets – 1.6 lakhs/cu.mm).

Discussion

Our patient presented with iron deficiency and severe anemia associated with pancytopenia. The patient improved clinically with blood transfusion and iron replacements. There have been two previous case reports demonstrating iron deficiency presenting as

pancytopenia. In both reports, iron transfusion led to a worsening of leukopenia and thrombocytopenia. In contrast, there was no worsening of leukopenia and thrombocytopenia with iron supplementation in our case. The pathogenesis of IDA-associated thrombocytopenia is not known. Donald TP et al. 1 (13) From animal studies, a large dose of Erythropoietin could cause thrombocytopenia. In Severe anemia, Erythropoietin is elevated, which could result in thrombocytopenia. As per Eolia Brisson et al. 1, it is likely that, in severe iron deficiency, the erythropoiesis pathway becomes vital and is, therefore, “preferred” to thrombopoiesis (14). The leukopenia seen in iron deficiency, as in our patient, can be explained by the high level of Erythropoietin, which in animal studies has shown to downregulate neutrophil production

Conclusion

This case illustrates two uncommon associations of a prevalent disease: severe iron deficiency associated with pancytopenia.

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Multi - Vitamin Deficiency Presenting as Hemolytic Anaemia with Failure

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Abstract

Twenty years old vegetarian male admitted with features suggestive of hemolytic anemia and pancytopenia. Laboratory investigations revealed Multiple vitamin deficiencies (B1, B6, B12). After the replacement patient showed clinical improvement, lab parameters improved on follow-up visits. We present this case to emphasize the atypical presentation of Multiple - Vitamin deficiency.

Keywords - Vitamin deficiency, Haemolytic anemia, Pancytopenia, Vitamin B12, Vitamin B1, thiamine.

Introduction

Vitamins are essential components of the human diet (1). Vitamins are synthesized inadequately or not in the human body(2). Vitamin B1 deficiency wet beriberi presents as high output cardiac failure, and Shoshin beriberi presents as cardiovascular collapse and death within hours if untreated (3). Vitamin B12 is a water-soluble vitamin in animal products (2). Physiologic functions of vitamin B12 include erythropoiesis, the synthesis and maintenance of myelin sheath, and the synthesis of nucleic acid (DNA) (4 -9). Vitamin B12 Deficiency is one of the correctable causes of hemolysis due to ineffective erythropoiesis (10).

We report this case to emphasize the atypical presentation of Multiple - Vitamin deficiency as hemolytic anemia.

Case details

Twenty years old vegetarian male with no known co-morbidities admitted with complaints of yellowish discoloration of eyes, easy fatigability, loss of appetite, and Breathlessness (NYHA IV) for the past month. On examination, the Patient was Obese, tachypnoeic at rest (RR-37/ minute), pallor, icteric, and JVP were elevated.

Vitals: PR 135/minute, Spo2 – 80% RA, BP – 120/70. Cardiovascular, Per-abdomen and neurological examinations are within normal limits. Respiratory system bilateral basal crepitations were present.

Laboratory results on admission and follow ups

Investigation	On admission	After 1 week	After 4 weeks
Haemoglobin	1.8 gm/dl	5.8 gm/dl	8.8 gm%
Total count	3100 /cu.mm	7000 / cu.mm	6500 / cumm
Platelets	47000 /cu.mm	115000 /cu.mm	2,10,000 /cumm
MCV	107	95	87
HCT	8	20	32
Urea/creatinine	20/0.7 mg/ dl	32/0.7 mg%	
Bilirubin (indirect + direct)	15.4 (10.7 + 4.7) mg/dl	6.0 (4.3 + 1.7) mg %	2.2 mg%
Total protein/Albumin	5.7/3.6 Gm/dl	5.5/ 3.4 gm%	5.3 / 3.5 gm %
SGOT/SGPT	261/97 U/L	45/22 U/L	33/22 U/L
Urine bile salts and pigments	Negative	Negative	

Serum LDH was 1596 U/L, ANA – Negative, DCT – Negative. The peripheral smear showed Pancytopenia - microcytic hypochromic anemia with markedly decreased macro ovalocytes, WBC, and platelets. CT chest bilateral minimal pleural effusion. Ct Abdomen – Minimal

ascites. The reticulocyte production index – is 0.08%. ECG – sinus tachycardia and echocardiogram -Mild MR, Mild TR, and minimal pericardial effusion.

Test name	Value	Normal value
Vitamin B1/ Thiamine	< 0.3 ng/ml	0.5 – 4.0 ng/ml
Vitamin B2/ Raiboflavin	22.7 ng/ml	1.6 -68.2 ng/ml
Vitamin B3/ Nicotinic acid	0.33ng/ml	0.3 – 9.8 ng/ml
Vitamin B5 /Pantothenic acid	25.4 ng/ml	11- 150 ng/ml
Vitamin B6 /P5P	3.72 ng/ml	5-50 ng/ml
Vitamin B7 / Biotin	0.24 ng/ml	0.2 – 3 ng/ml
Vitamin B9 / Folic acid	0.7 ng/ml	0.2 – 20 ng/ml
Vitamin B12	95 pg/ml	211- 911 pg/ml

Treatment

He was started on 1 point packed cell transfusion, INJ. Vitamin B12 1000mcg iv od , T. Folic Acid 5 mg od, Inj. Thiamine 200 mg Iv TDS and supportive case as per the clinical condition. On Day 3, her breathlessness decreased, Tachycardia and tachypnoea subsided, and SPO2 was 99 percent in room air. Repeat investigations after one week showed improvement in Haemoglobin, Total count, platelets, and a decrease in Total bilirubin and Normal echocardiogram. He was discharged monthly with IM Vitamin B12, T. thiamine, and T. Vitamin B6. He is on regular follow-up with good clinical improvement.

Discussion

Vitamin B12 is crucial for DNA synthesis and erythropoiesis, a deficiency that could manifest as Haemolytic anemia, reversible with Replacement. In severe B12 deficiency, intramedullary hemolysis with leukocyte and

megakaryocyte destruction leads to high LDH levels, low haptoglobin levels, and pancytopenia (4-9). Subacute combined degeneration due to demyelination in the spinal cord's dorsal and lateral columns could also manifest B12 deficiency. Present case: Multiple vitamin deficiencies (B1, B6, B12) presented as Haemolytic jaundice in failure. Though Failure symptoms could be attributed to severe anemia, Vitamin B1 deficiency could also present as High output cardiac failure (Wet beriberi). Further investigations to rule out malabsorption cannot be done because of limited resources. But Vitamin B1, B6, and B12 Deficiencies can be explained by a vegetarian diet for the patient.

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