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A Case Report of Pancytopenia with Megaloblastic Anaemia

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Introduction

Most common cause of pancytopenia is Megaloblastic anemia, followed by acute myeloid leukemia and aplastic anemia. Bone marrow examination is a single useful investigation which reveals the underlying cause in patients with pancytopenia.[1]

Folic acid and cobalamin are B-group vitamins that play an essential role in many cellular processes. Deficiency in one or both of these vitamins causes megaloblastic anaemia, a disease characterized by the presence of megaloblasts.

Iron deficiency anemia (IDA) is the most common nutritional deficiency disorder in both developing and developed countries and it was reported that more than 500 million people worldwide are estimated to have IDA [2,3].

IDA is the most common type among all other anemia and it happens when the bodydoesn't have enough iron to make hemoglobin. Iron deficiency is an end result of prolonged negative iron balance, mainly due to poor dietary availability, rapid growth of the person, and blood loss due to heavy periods, ulcers, in the blood and in terms of public health anemia is defined as the low concentration of hemoglobin i.e. <12 gm%[4]. Iron deficiency affects more people than any other condition, constituting a colon polyps, or colon cancer. Sometimes, pregnancy can also cause IDA if there is not enough iron for the mother and fetus[5]. The pathophysiological changes in IDA are categorized into three stages. The first stage involves pre-latent deficiency where liver, spleen and bone marrow show reduced iron stores; second stage shows latent deficiency which is the condition with very low or absent bone marrow iron stores and there is a progressive reduction in plasma iron (bone marrow iron is absent, serum ferritin is <12µg/l, transferrin saturation is <16% and free erythrocyte porphyrin is increased) however, hemoglobin concentration remains normal; and finally IDA is a very late stage of iron deficiency with progressive fall in hemoglobin levels and mean corpuscular volume[6].

Case Report

A twenty two year-old, moderately built male was admitted indoor patient medicine ward at a VSSIMSAR, Internal Medicine Dept, Burla, Odisha, with the chief complaints of generalized

weakness and dyspnea. He had 4 episode of fever with anemia for which, he was admitted in local hospital in past, last 7 year, during which he received two to three unit blood, in each admission. He had no history of black stool or melena or upper gastro intestinal tract bleeding. He is non-alcoholic and taking both vegetarian and non-vegetarian diet.Now with similar complain of generalized weakness and fatigue, admitted to internal medicine ward.

On Examination:

Pallor present. spleen not palpable, mild hepatomegaly present.

Investigation

Hemoglobin (gm %): 2.7gm%
Total red blood cell count (mil/mm3):1.2 x 10^6ul
Total white blood cell count (/mm3):2730
Platelet count (lakh/mm3): 50000
Mean Corpuscular volume (fl): 66.8
Mean corpuscular hemoglobin (pg): 22.3
Mean corpuscular hemoglobin: 33.4
Red cell width (RDW): 41.2%

Erythrocyte sedimentation rate (mm/hr): 20
Serum Vitamin B12 (pg/ml): > 1515 pg⁄ml
Sr. LDH: 1429 U⁄L
Direct COOMB test: Negative
Indirect COOMB test: Negative
Sickling slide test: Negative
Hb Electrophoresis: AA pattern

Peripheral blood smear

Anisopoikilocytosis, Macroovalocyte, tera drop cell, occasiona NRBC, TCL is reduced, DC normal, platelet series reduced, suggestive of **Pancytopenia**.

Bone marrow aspiration cytology

Hypercellular bone marrow, megaloblast, few giant meta myelocyte, mitosis seen in erythryoid series suggestive of **Megaloblastic anemia.**

Discussion

This is an anemia suggesting anemia of chronic disease as evidenced by history of repeated fever and increases in red cell width, suggesting Iron deficiency anemia as evidenced by increase mentezer index, suggesting Pancytopenia by Peripheral blood smear, and Megaloblstic anemia by bone marrow aspiration study. Serum LDH is raised suggestive of haemolysis, but direct comb test is negative and indirect comb test is negative, so not suggestive of auto immune haemolyticanaemia. Sickling test is negative, Hb Electrophoresis has 'AA' pattern, suggestive of no haemoglobinopathy.

Treatment given: Tab Folic acid, 3 unit Blood transfusion and advised for follow-up.

IDA observed in a young moderately built male, which we generally observe in pregnant women because of ability of fetus to extract its iron requirements from mother and iron deficiency is the commonest condition occurs in 80% of pregnant women [6,7]. Here, in this case the patient observed the symptoms of generalized weakness and dyspnea is due to reduced oxygen carrying capacity by the deficiency of hemoglobin (anemia). Patients with IDA generally have the elevated platelet count and the present case also shown the condition of thrombocytosis.[8,9]

The reasons for Pancytopenia with megaloblstic picture in bone marrow aspiration cytology, were still unclear, further evaluations are necessary to rule out the actual etiology. Bone marrow biopsy and a complete family history and upper G I Endoscopy to rule out atrophic gastritis and other auto immune causes are needed to understand the specific causes for this megaloblastic anemia.

Conclusion

In this case, we were diagnosed the case as Pancytopenia with megaloblstic anemia by clinical examination and hematological parameters. Bone marrow aspiration cytology suggest megaloblastic anemia.

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