Case Report

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Anaemia Mukt Bharat: A Contrasting Case Report

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Abstract

Anaemia Mukt Bharat is an ambitious programme for reducing the prevalence of anaemia among the most vulnerable of populations in the country; that is women and adolescents girls. The diagnosis of anaemia under the programme is epidemiological and deals with the most common causes of the condition that is dietary deficiency of iron and also co-existing infections like helminthiasis. However, occasionally the primary care personnel are likely to come across complicated cases of anaemia due to not so uncommon causes such as vitamin B12 deficiency. Though it appears straight forward to diagnose and treat a case of megaloblastic anaemia, sometimes the investigation results can be misleading and often alarming even to a patient. The programmatic approach in such cases is rather tardy and not very gratifying to the physician. We present a case of pancytopenia during COVID-19 period which presented unique challenges, however, managed with consistent follow-up and referral care along with dietary management of the condition which resulted in the alleviation of symptoms. The lessons learnt could be integrated into the programmatic approach to rarer conditions precipitating anaemia in adolescent age group. This age group is susceptible to many issues associated with transition to adulthood including dietary fads.

Keywords: Anaemia; Anaemia Mukt Bharat (AMB); Vitamin B12; Megaloblastic Anaemia; Dietary factors.

Introduction

The decadal progress in the reduction in the prevalence of anaemia in India has not been very impressive. Between NFHS 3 and NFHS 4, there was only a 2% reduction of anaemia in adolescent girls.[1] While there could be many social reasons such as early marriages and subsequent pregnancies among the girls in the country, the medical reasons for the condition might be baffling to primary health care workers. Hemoglobin levels of less than 12g/dl among adolescent age group is not that surprising in a community setting. However, if accompanied with a history of malignancy in the family, a severe case of anaemia could be a panic for the patient and the family members. The national campaign of Anaemia Mukt Bharat has 6 interventions to battle the scourge of ever present anaemia among the women and adolescents.[2] In addition to deworming, iron and folic acid (IFA) supplementation remain the mainstay of management of anaemia under this programme. The change is mainly in the dosing and duration of the IFA tablets which currently has been updated to 60 mg of elemental iron for a minimum of 180 days with

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a doubling of the duration among pregnant and lactating women. As much as possible this tolerable dose is given once daily unless the patient is anaemic. The programme marginally addresses other causes of anaemia during the adolescence through fortification of food like wheat with iron, folic acid, and vitamin B12.

Severe anaemia is characterized by the presence of less than 8 g/dl of haemoglobin among adolescents. About 7% of girls were found to be having severe anaemia in a study conducted in Delhi.[1] This underscores referral and expert management of these cases especially when a confounding clinical picture is encountered in such cases. Usual management of anaemia cases in AMB is by checking haemoglobin alone using digital methods such as Hemocue (Hb 301)®.[3] Other investigations are rarely available and management is by trial and error method on a monthly step up basis such as trying out IFA tablets twice a day for 1-2 months and on improvement tapering the dose to single prophylactic dosage. If there is no improvement, the patient is referred to First Referral Unit (FRU). If at all there exists a complicated blood picture with a fear of malignancy in the background, an educated patient/parent might opt for more investigations and consultations with tertiary experts.

Patient Information

A 14-year old female patient presented to the family medicine OPD of a tertiary care centre with nausea, severe breathlessness, palpitations, and easy fatigability. She was unable to attend school for the past 15 days due to excessive fatigue. She was taken to a near by tertiary care hospital. The patient attained menarche at the age of 11 years and had regular menstrual cycles. On examination, weight was 63 kg, pallor was present with pedal oedema and facial puffiness. Heart rate was 102 per minute and BP was 126/62mmHg. Laboratory investigations revealed severe anaemia with hemoglobin of 4.3 g/dl. Her mother who had a known history of carcinoma breast was concerned about the child. Routine investigations revealed a low hematocrit (Hct) of 11.8% with a picture of pancytopenia. She had an RBC count of $1.06x10^6$/ul and Total Leucocyte Count was $3.17x10^3$/ul, with a low Absolute Neutrophil Count of $1.68x10^3$/ul. Her differential leucocyte count showed a slight shift to lymphocyte proportion (40%). Platelet count was found to be to $116x10^3$/ul with a Plateletcrit of 0.13%. Mean Cellular Volume of RBC (MCV) was high (111.4 fL) with an elevated Mean Platelet Volume (MPV) of 11.2µm.[3] Mean Corpuscular Haemoglobin (MCH) and Mean Corpuscular Haemoglobin Concentration (MCHC) were elevated at 40.2 pg and 36.1 g/dL respectively. Her Red Cell Distribution Width (RDW) of 34.2% indicated moderate to severe anisocytosis. Platelet Distribution Width was found to be normal at 13.2%. Her Urine Routine Examination (URE) showed the presence (+) of albumin and blood (RBCs) along with bilirubin of (++) levels. The diagnosis was somewhat straight forward except for the elevated levels of Serum Iron (228.7 mg/dL) and Vitamin B12 (250.6 pg/dL). The management options were extended to some extra additional tests as per request of the parent and out of academic interest. The patient's mother had a history carcinoma of breast for which she underwent chemotherapy for a period of five years.

Bone marrow aspiration cytology was performed elsewhere and the simultaneous hemogram picture was as shown in figure 1. Hemoglobin level was confirmed in the bone marrow to be 3.8 g/dL with low WBC count of 3410 cells/ul which was lower than shown in the peripheral blood. The red cells were macrocytic with an agglutination pattern.

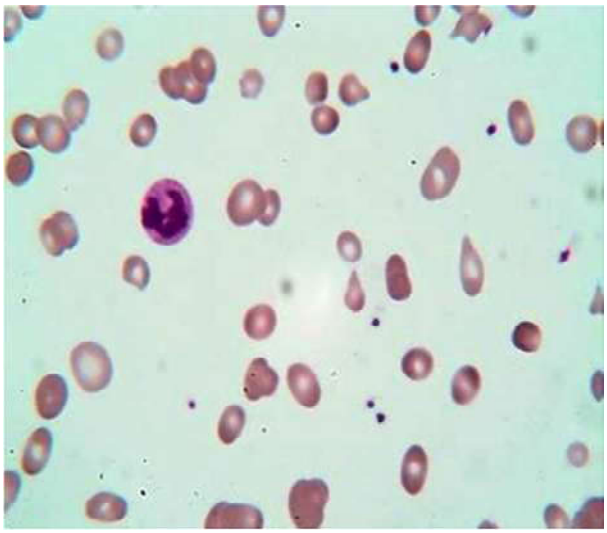

Figure 1: Peripheral Blood Smear.

There was aniso-poikilocytosis with microcytes, spherocytes, and teardrop cells. The platelet count also was diminished at 1,10,000/cumm. MCV was 115 fL with MCH of 41.2 pg and MCHC of 35.9 g/dL. The differential count was found to be normal in bone marrow examination. Hypersegmented polymorphs were seen. Bone marrow was particulate and hypercellular.

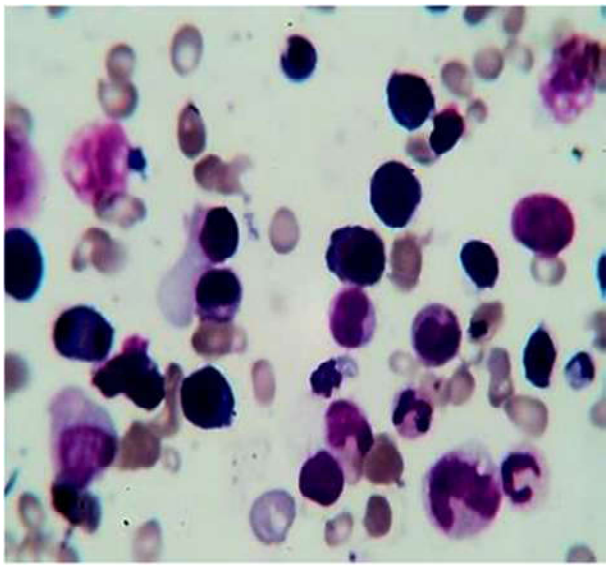

Figure 2: Bone Marrow Aspirate.

M:E ratio was 1:2. Myelogram count out of 500 revealed 1% blasts; 2% promyelocytes; 12% myelocytes; 15% metamyelocytes; 49% neutrophils; 10% lymphocytes; 6% monocytes; 5% eosinophils and nil plasma cells. There was erythroid hyperplasia with megaloblastic maturation. Early and intermediate erythroblasts were seen. Bone Marrow dysplasia was evident (<10%) with irregular nuclear margins and bi-lobation. Nuclear budding and karyorrhexis were present likewise in less than 10% erythroid cells. Orderly maturation of granulocytes pointed to normal series with no evidence of blast cells. Only megakaryocytes with no evidence of dysplasia were reassuring. Iron stores in the marrow were seen to be reduced (1+, reduced) despite normal iron levels in serum. The overall impression was that the marrow was hypercellular with erythroid hyperplasia with megaloblastic changes. Direct Coombs test (DCT) was negative. Ultrasound abdomen also revealed nothing untoward.

However, the presence of bilirubin in urine was a conundrum. There are reports in the literature with suggestions of the presence of jaundice in pernicious anaemia albeit due to other causes such as hemochromatosis and thrombotic microangio pathy.[4–6] Unconjugated hyperbilirubinemia is also a manifestation of pernicious anaemia masquerading as pseudo-thrombotic microangiopathy.[5,6] Conjugated hyperbilirubinemia, if any, in this case, however, could not be investigated in detail because of the socio-economic reasons and prevailing COVID-19 situation.[7]

Treatment

The patient was prescribed Tab. Prednisolone 20mg thrice daily dosage along with a PPI inhibitor initially by a general practitioner for 10 days and she was adviced blood transfusion. The patient was on prednisolone for about one week. She could not make arrangements for transfusion due to the COVID-19 situation. Hence, she returned back to the initial tertiary care hospital for further management. The patient was consulted by General physician and blood transfusion was withheld as there were signs of clinical improvement. She was prescribed Methylcobalamine (1000mcg) once daily, Syrup Iron (100mg elemental iron) twice daily and Prednisolone 20mg twice daily for another 15 days and advised to include B12 rich foods in diet. She was advised to repeat CBC after 15 days and there was marked improvement of Hb to 8.9 gm%. She was asked to continue the same treatment for 15 more days. Hemoglobin percentage improved to 11.8 gm% after 15 days. WBC and Platelet count also increased markedly to near normal levels. (RBC were at 5.11 x 10^6/ul and Total Leucocyte Count was 10.9x10^3/ul with 70% neutrophils and 21% lymphocytes. Platelet count was found to be to 2.34x10^6/ul. MCV was 89fL with an MPV of 11.2 um^3. MCH and MCHC were at 23 pg and 25 g/dL respectively.) The patient was asked to continue same treatment for one more month except for Prednisolone which was tapered to 10mg twice daily for 10 days, 10mg once daily for next 10 days and then stopped. Repeat Hb after three months of treatment was found to be 12.4g%.

Discussion

Anaemia Mukt Bharat is an ambitious effort from the Government of India which aimed at reducing the silent epidemic of iron deficiency anaemia (IDA). Because of the high prevalence of IDA, the major strategy was the provision of iron and folic acid syrup/tablets to the 6 vulnerable groups. Deworming along with digital testing for anaemia were the other stipulated components. The target group of adolescent girls between 15 to 19 years with 54% anaemia prevalence is a priority because of their potential to get married and bear children. The programme stipulated prophylaxis of this group with blue-colored tablets under the weekly iron folate supplementation regime. While the overall program included non-nutritional causes of anaemia in endemic pockets, with a special focus on malaria, hemoglobinopathies and fluorosis; megaloblastic

anaemia due to vitamin B12 deficiency was omitted altogether. These cases might be rare but the PHC medical officers are left in a lurch when such patients turn at the centres.

AMB stipulates that, cases similar to the reported one (if Hb 8-12g%) must be treated with Iron Folic Acid (IFA) tablets (60 mg of elemental iron and 500 mcg of folic acid) twice a day, for a period of 3 months. If there is no improvement over 3 months, only then the adolescent shall be referred to FRU or DH directly without the primary health centre acting on the reason for the condition. As exemplified by the case in point, a short course of oral steroids with Vitamin B12 supplementation and nutritional advice led to tremendous clinical improvement. The lack of health care equipment in PHCs other than a haemoglobinometer is a worrying prospect in the current scenario and the suggestions arising out of the case report may serve as an eye opener for improving care delivery in a primary care setup instead of referral as warranted in the AMB document. The PHCs are involved in many instances in parenteral therapy of IDA by Iron sucrose injections without any higher investigations as could have happened in the current case. This might further delay the diagnosis of a possible vitamin B12 deficiency. B complex tablets given alongside might mask the major deficiencies in a general practice setting. However, concerns arises especially in case there are haemolytic manifestion in ancillary investigations such as urine bilirubin etc. This warrants a specialist approach and hence keeping the patient in the PHC might prove to be a risk. However, as the AMB programme stipulates that the therapeutic trial be kept up (including iron sucrose injections if any) for 3 months before referral, additional interventions might prove to be synergistic and less troublesome to the patient.

Patient Perspective (Informed Consent was taken from the patient)

At start of my illness I thought my symptoms were due to general weakness and will subside if taken rest. But after a few days I was not even able to walk a small distance due to breathlessness. We reached the hospital and doctor advised us some blood tests. They told I have very low levels of blood cells and I should undergo complete evaluation as my mother had history of breast cancer. My parents were worried about me and they thought I too had some kind of cancer. The blood tests conducted were not painful but the bone marrow aspiration was painful. While using steroids I suffered hair fall, swelling of face and body and there were small red spots on my face. I started drinking milk and taking curd everyday in my daily meals. I started eating healthy food instead of taking junk foods after advise from doctors. I took all the medication given by doctors regulary. Now I have no symptoms and I am very happy that my illness is only due to dietary deficiency and not due to any cancer.

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