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MEGALOBLASTIC ANEMIA – AN UNDERDIAGNOSED PUBLIC HEALTH PROBLEM

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ABSTRACT

Introduction: Megaloblastic anaemia is a general term used to describe a group of anaemias caused by impaired DNA synthesis. Megaloblastic anaemia is not uncommon in India, but data are insufficient regarding its prevalence, and causative and precipitating factors. We did a retrospective and prospective study to document such data for patients of megaloblastic anemia. **Aims and objectives:** To study the prevalence of megaloblastic anemia, its causative and precipitating factors and lastly its treatment. **Material and methods:** Approx. 400 patients admitted were investigated for megaloblastic anemia, their presenting complain, age of presentation, sex incidence, their dietary habits, etc. **Results:** Most of patients diagnosed as megaloblastic anemia were deficient in cobalamin and most were vegetarian. **Conclusion:** Megaloblastic anemia is relatively underdiagnosed cause of anemia. Treatment is very simple, affordable their in time treatment is important to prevent development of irreversible neurological complications.

KEYWORDS: megaloblastic anaemia, prevalence, Vitamin B12, vegetarian.

INTRODUCTION

Megaloblastic anaemia is a general term used to describe a group of anaemias caused by impaired DNA synthesis. It is characterized by abnormal findings in peripheral blood smear (macroovalocytes) and bone marrow samples (megaloblastic hyperplasia). Megaloblasts, the hallmark of these anaemias, are caused by asynchronous maturation between the nucleus and the cytoplasm due to DNA synthesis impairment.[1-3]

The discovery of megaloblastic anaemia and its aetiology was the result of the efforts of many different medical researchers. It was first characterized by Addison in 1849 as anaemia, general languor and debility.[4] Osler and Gardner in 1877 noted the association with neuropathy, and 10 years later Lichtheim documented myelopathy. Megaloblasts were identified for the first time by Ehrlich in 1880. In 1920, abnormalities in white blood cells were described. In 1926, Minot and Murphy showed that the disease could be reversed by the intake of large quantities of liver.[5] Three years later, Castle established that gastric acid contains an "intrinsic factor" that combines with an "extrinsic factor" to allow this latter to be absorbed.[6] Hodgkin later identified the structure of vitamin B12, for which he received the Nobel prize.[7] Years later, in 1948, Herbert discovered the structure of folic acid and described its association with the aetiology of megaloblastic anaemia.[8]

Macrocytosis is found in 2.5-4% of adults who have a routine complete blood count. In up to 60% of cases, macrocytosis is not accompanied by anemia; however, isolated macrocytosis should always be investigated. Macrocytosis without anemia may be an indication of early folate or cobalamine deficiency, as macrocytosis preceded development of anemia. The average Indian vegetarian diet is deficient in cobalamine.[9]

MATERIAL AND METHODS

A hospital-based retrospective and prospective analysis of case records of all patients admitted and diagnosed as anemia was taken and among anemic patients a haemoglobin < 10 g/dl and/or mean corpuscular volume > 95 fL and blood film findings consistent with megaloblastosis were included in the study. Diet (vegetarian/non-vegeterian), drug intake, previous blood transfusion and presenting symptoms were recorded. Presenting symptoms and findings were obtained from medical records of patients. Complete blood counts, blood film examination, reticulocyte count and cobalamin and folate assays were done. Megaloblastic anaemia was diagnosed in 25 patients with anaemia. Those with a diagnosis of aplastic anemia and leukemia were excluded from the study. The study period is for 6

months and all the patients admitted from the age group of 12 years to 60 years were included in the study.

RESULTS

Among 400 admitted patients studied in the specified period. 25 patients were diagnosed with megaloblastic anemia (with prevalence of megaloblastic anemia 6.25 %). 15 patients were deficient in cobalamin (vit B12 < 150 pg/ml) (60 %), 6 were deficient in both (25%), 2 were only deficient in folate (8%), 2 have more than (>1000 pg/ml of vit b12 level) (8%) the female patients (15) outnumbered male (10) with male: female ratio 1.5: 1. Resolution of anemia was seen with treatment in 21 patients who subsequently followed-up. The mean time taken for resolution of anemia was 45- 60 days. There was a resolution of the neurological signs. The MCV became < 95-100 pg/ml during 30-45 days period of follow up.

Table-1.

	Only Vitamin B12 low	Only folate low	Both vit B12 and Folate low	Both vit B12 and Folate normal or increased
No of patients (25)	15	6	2	2
Incidence	60 %	25 %	8 %	8 %

DISCUSSION

Megaloblastic anaemia was diagnosed from complete blood counts, red cell indices, blood film examination and assays of the two vitamins (Vitamin B12 and Folic acid). Bone marrow examination was not essential for diagnosis. Cobalamin deficiency was the major cause of megaloblastosis. Aetiological factors were a diet poor in cobalamin or folate, parasitic infections like Diphyllobothrium latum, alcoholism, vegetarianism, gastrectomy, the use of acid-suppressing medication ,drugs like oral contraceptives and anticonvulsants, increased requirements during the growth period and pregnancy, and the haematinics and transfusions provide only short term benefits, and that long term follow up and diet counselling is crucial. Physicians managing these patients need to be aware of the timing of blood sampling for assays. The only dietary sources of Vitamin B_{12} are foods of animal protein origin such as kidney, liver, heart, muscle meats, fish, eggs, cheese and milk. In contrast to folate, vegetables contain practically no Vitamin B_{12}. Cooking has little effect on its activity. Vitamin B_{12} is synthesized in the human large bowel by microorganisms but is not absorbed from this site and thus, the humans are entirely dependent upon dietary sources. Vegetarians are more prone for megaloblastic anemia as compared to that of nonvegetarians. Some studies show that 40% of normal Indian subjects with normal hemograms were cobalamin deficient.[10]

To conclude megaloblastic anemia is one of the common causes of underdiagnosed anemia. In our study, the prevalence of megaloblastic anemia was 5-6 %, and most cases were due to vitamin B12 deficieny. Most patients were vegetarian and non-vegetarian with little or infrequent assess to nonveg food. The treatment is very simple and affordable even to poor. If left untreated, it can lead to morbidity both because of anemia and associated neurological involvement. A correct diagnosis about cause and prompt and effective therapy with cyanocobalamine can lead to a complete and an eventful recovery and decreasing the prevalence and burden of underdiagnosed anemia.

CONFLICT OF INTEREST

None

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