Clinical profile and response in patients with megaloblastic anemia

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Abstract

Background: Megaloblastic anemia is one of the frequently occurring diseases in a developing country such as India. Megaloblastic anemia occurs mainly because of vitamin B12 and folate deficiency, but in some cases, it may occur owing to the causes affecting the metabolism of vitamins or the defect in DNA synthesis. Very few studies have been conducted to study the prevalence of megaloblastic anemia in the general population.

Objective: To find out the age-wise pattern with its clinical profile and response to the treatment.

Materials and Methods: A cross-sectional, observational study was carried out at LG Hospital, a tertiary-care teaching hospital. The study was carried out during the period from August 2006 to May 2008. The patients who presented with clinical features of anemia in medical outpatient department between August 2006 and May 2008 were evaluated with complete blood count with RBC indices.

Result: Incidence on megaloblastic anemia was the highest in the subjects aged between 40 and 49 years. Weakness and abnormal bowel habits were the common presenting symptoms. Pallor and glossitis were the most common clinical signs. About 94% of the patients presented with moderate to severe anemia. Almost all the patients showed a dramatic response in Hb level, mean corpuscular volume, and reticulocyte count.

Conclusion: Vitamin B12 deficiency is not uncommon in India. This study will definitely help clinicians for the diagnosis and treatment of megaloblastic anemia.

KEY WORDS: Megaloblastic anemia, vitamin B12 deficiency, folic acid deficiency, clinical profile, response

Introduction

Megaloblastic anemia is one of the frequently occurring diseases in a developing country such as India. Megaloblastic anemia occurs mainly because of vitamin B12 and folate deficiency, but in some cases, it may occur owing to the causes affecting the metabolism of vitamins or the defect in DNA synthesis.[1]

As vitamin B12 is present in foods of animal origin, dietary vitamin B12 deficiency is less common but is seen in strict vegetarians who avoid all dairy products, meat, and fish. Pernicious anemia is an autoimmune illness in which autoantibodies destroy gastric parietal cells and, hence, produce intrinsic factor deficiency that is required for the absorption of vitamin B12 from the intestine.[2]

Apart from easy fatigability and tachycardia, the deficiency also produces changes in mucosal cells, leading to glossitis and other vague gastrointestinal disturbances such as anorexia and diarrhea. Vitamin B12 deficiency also produces a similar blood picture and, in addition, leads to a complex neurologic syndrome. Specific treatment requires use of the deficient element. In folic acid deficiency (usually nutritional),

only folic acid is required. In pernicious anemia, where oral absorption of vitamin B12 does not take place, treatment is the administration of vitamin B12 by parenteral route.[3]

Very few studies have been conducted to study the prevalence of megaloblastic anemia in the general population. So, this study was conducted with the objective to find out the age-wise pattern with its clinical profile and response to the treatment.

Materials and Methods

A cross-sectional, observational study was carried out at LG Hospital, a tertiary-care teaching hospital affiliated to AMC MET Medical College, Ahmedabad, Gujarat, India. The study was carried out during the period from August 2006 to May 2008. Prior permission was taken from Institutional Ethics Committee. The patients who presented with clinical features of anemia in the medical outpatient department between August 2006 and May 2008 were evaluated with complete blood count (CBC) with RBC indices. Patients with Hb level < 13 gm/dL and mean corpuscular volume (MCV) level >100 fL were selected for further evaluation. Bone marrow examination was done to confirm the occurrence of megaloblastic anemia. Serum B 12 level was done before the initiation of the therapy. Other investigations such as renal function test, liver function test, and urine and stool examinations were done. An injection vitcofol (2 cc IM), was given for 7 days and, then, once weekly, given for 4 weeks. Follow-up evaluation was done with CBC, RBC indices, and reticulocyte count.

Result

Of the 50 patients, 23(46%) were female and 27(54%) male patients [Table 1]. The highest incidence of megaloblastic anemia was in the subjects between the age group of 40 and 49 years. It was also evident that the middle-aged and elderly population is at a higher risk to develop megaloblastic anemia, as 82% of the patients are aged > 40 years [Table 2]. Weakness, anorexia, weight loss, and abnormal bowel habits were the most common presenting symptoms in megaloblastic anemia [Table 3]. A significantly high number of patients also presented cardiorespiratory symptoms, probably, because of moderate to severe anemia affecting the oxygen transport.

About 80 patients with megaloblastic anemia were lacto-vegetarian and remaining taking mixed diet [Table 4]. History of alcoholism was also obtained in 26% of the patient population signifying its role in the causes. Pallor, being the hallmark of clinical signs (100%), was followed by glossitis (20%), neuropathy (10%), and cardiac failure (8%) [Table 5]. Most of the patients revealed moderate to severe anemia. Total WBC count was found subnormal in about 60% of the patients, thrombocytopenia (26%), and hypersegmented neutrophils (14%). A small number of patients (8%) presented dimorphic marrow changes, and others (92%) exhibited megaloblastic marrow. Dramatic responses in Hb level and RBC morphology

were seen. In a small number (4%) of the patients, the response was inadequate requiring further investigation.

Table 1: Distribution of the patients according to gender

Sex	No. of cases	Percentage
Female	23	46
Male	27	54
Total	50	100

Table 2: Distribution of the patients according to different age groups

Age group (years)	No. of cases	Percentage
20–29	1	2
30–39	8	16
40–49	22	44
50–59	14	28
60–69	3	6
70–79	2	4

Table 3: Distribution of the patients according to presenting symptoms

Symptoms	No. of cases	Percentage
Weakness/fatigue	30	60
Edema	7	14
Weight loss	10	20
Fever	5	10
Anorexia	14	28
Abdominal pain	4	8
Abnormal bowel habit	13	26
Paraparesis	5	10
Urinary abnormality (sphincter abnormality)	2	4
Cardiorespiratory abnormality	9	18

Table 4: Distribution of the patients according to dietary habits

Diet	No. of cases	Percentage
Mixed	10	20
Lacto-vegetarian	40	80
Alcoholism	13	26

Table 5: Distribution of the patients according to signs

Signs	No. of cases	Percentage
Pallor	50	100
Glossitis	10	20
Neuropathy (SACD)	5	10
Cardiac failure	4	8

Table 6: Response to treatment

	Pretreatment	Posttreatment
Average Hb (g %)	7.22	10.49
Average MCV (f1)	111.46	85.14
Average reticulocyte count (%)	2.14	5.04

Discussion

Vitamin B12 deficiency may present with variable clinical manifestations, but the most common presentation is megaloblastic anemia. In the western countries, pernicious anemia is the most common form of vitamin B12 deficiency. Folate deficiency is also another important cause of megaloblastic anemia. In contrast, in India, pernicious anemia is uncommon.[4] Although folate deficiency is an important cause of megaloblastic anemia, recent studies have suggested that vitamin B12 deficiency is also an important cause in India.[5,6]

In this study, the most common age of presentation of megaloblastic anemia was in the subjects aged 40–49 years, but all the age groups were affected. The peak incidence in another Indian study done by Khanduri and Sharma[6] was seen in the age group of 10–30 years.[6] In Caucasian and Chinese populations, megaloblastic anemia is reported to occur in the older age groups.[7,8] As in India, it affects all age groups and is possibly related to an inadequate diet. The male subjects were commonly affected in our study, which is in contrast with more female subjects affected in the study done by Khanduri and Sharma.[6]

Symptoms of anemia such as weakness, fatigue, exertional dyspnea, palpitations, dizziness, and aches and pains all over the body are commonly present; these symptoms are comparable with other Indian studies.[6,9] Pallor was found in all the patients of the study, followed by glossitis. These findings are comparable with the findings of the other studies.[6,10]

Because the vitamin does not occur in vegetable foods, vegans and strict vegetarians are at a high risk of its deficiency. Malabsorption, gastric atrophy, and reduced production of "intrinsic factor" are some other causes of deficiency. Pernicious anemia, which is a megaloblastic anemia, results owing to the deficiency of this vitamin, which is uncommon in India.[11] This causative association was supported by our study, as the majority of our patients were lacto-vegetarians (80%). A vegetarian diet is lacking in vitamin B12, and this can lead to megaloblastic anemia. Even those who consider themselves as nonvegetarians, usually, consume meat only occasionally.

Dramatic response in Hb level and RBC morphology was found in our study. In a small number (4%) of patients, the response was inadequate requiring further investigation.

Conclusion

Incidence on megaloblastic anemia was the highest in the subjects aged between 40 and 49 years. Weakness and abnormal bowel habits were the common presenting symptoms. Pallor and glossitis were the most common clinical signs. About 94% of the patients presented with moderate to severe anemia. Almost all the patients showed dramatic responses in Hb level, MCV, and reticulocyte count.

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