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# To evaluate clinical spectrum of megaloblastic anemia in a tertiary care hospital central India

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***Abstract*---**Background: Megaloblastic anaemia 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. Proper clinical assessment of megaloblastic anemia is very important for diagnosis and treatment. Aim and Objective: assessment of clinical profile of megaloblastic anemia in different age group, central Indian population. Material &Methods: A cross-sectional, observational study was carried out at a tertiary care centre, Madhya Pradesh, India. The patients who presented with clinical features of megaloblastic anemia in medical outpatient department were evaluated with complete blood count with RBC indices. Results: Of a total of 250 cases, 66 (26.4%) was diagnosed as megaloblastic anaemia. Commonly (34.8%) occurs in 16-30 years age group. More Frequent in vegetarians persons. Weakness/fatigue, anorexia and edema were the common presenting symptoms. Pallor hepato-splenomegaly and hyper pigmentation were the most common clinical signs. About 87.8%% of the patients presented with moderate to severe anemia. Conclusions: Megaloblastic anemia is common clinical problem with weakness, anorexia and pallor as major presentation. However some had neurological features.

***Keywords*---**Megaloblastic anemia, clinical profile Vitamin B12 deficiency, Pallor.

## Introduction

Megaloblastic Anemia is classically defined as a macrocytic anemia that is characterized by a specific megaloblastic bone marrow morphology showing metamyelocytes and megaloblasts, accompanied by leucopenia and thrombocytopenia [1-2]. Megaloblastic anemia occurs mainly because of vitamin B12 and folate deficiency, but in some cases, it may occur in defective DNA synthesis due to lack of vitamin B12 and folic acid [3-4]. Megaloblastic anemia is one of the frequently occurring diseases in a developing country such as India. It is commonly seen in infants with maternal B12 deficiency and adolescents [5]. The most common cause of megaloblastic anemia in Indian population is taking vegetarian diet, which is deficient in cobalamine [6]. The clinical presentations of megaloblastic anemia are weakness, growth retardation of failure, frequent illness such as diarrhea, glossitis, or neurological symptoms [7]. Most cases of megaloblastic anaemia corresponded to a severe macrocytic anaemia with hyper-segmented neutrophils, isolated macrocytosis, hyper cellular bone marrow megaloblasts, giant cells, abnormal megakaryocyte and very high serum lactate dehydrogenase (LDH) level [8].

Definite diagnosis of megaloblastic anemia is made by bone marrow examination and demonstration of characteristic megaloblasts. They have large size and delicate sieve like nuclear chromatin. An unusually large number of mitotic figures are found among the erythroid cells. Elevated serum LDH are observed in a variety of conditions [9] This study was carried to find out common clinical presentation of megaloblastic anemia in patients attending medicine OPD, in our tertiary care hospital, Madhya Pradesh.

## Materials and Methods

This cross-sectional, observational study was carried out in the Department of medicine in a tertiary care hospital, central India. The patients who presented with clinical features of anemia in the medical outpatient department were evaluated for megaloblastic anaemia. Detailed history, socio-demographic data, history of illness, clinical sign, symptoms and complete clinical examination were done in all the suspected patients. Laboratory investigation was done: peripheral blood smear, complete blood count (CBC) with RBC indices Megaloblastic anemia was defined as the 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. The all data were analysis statistically using SPSS (version 22).

## Results

A total of 250 cases aged between 16 to 78 years, clinically suspicion of anaemia were included in our study, out of which megaloblastic anaemia was diagnosed in 66 (26.4%) of patients.

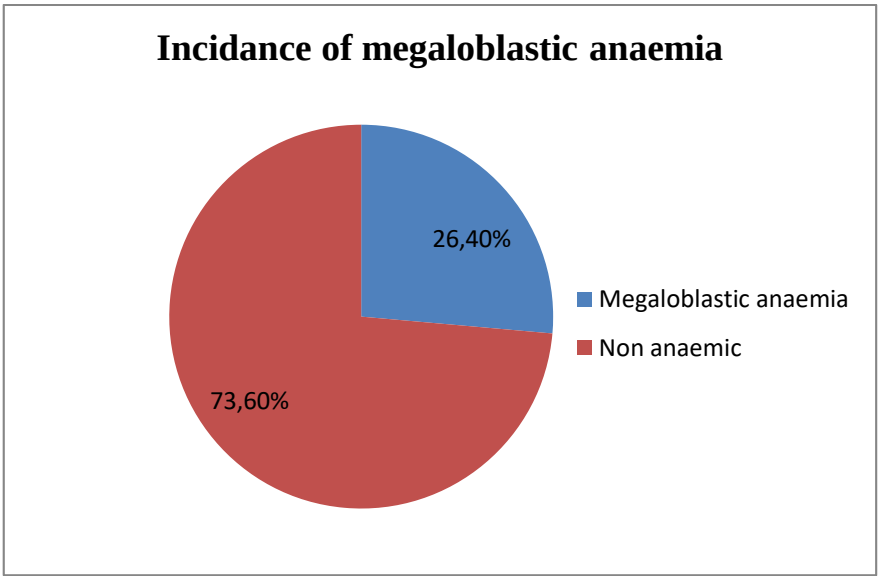


Figure 1: incidence of megaloblastic anaemia

Maximum patients (34.8%) were from age group 16-30 years followed by 24.3% patients were from 31-40 years age group. This means 59.1% of anaemia population was between 16 to 40 years of age group.

Table 1: Age wised distribution of megaloblastic anaemia patients

| S. No. | Age (in years) | Number of patients | Percentage |
|---|---|---|---|
| 1 | 16 – 30 | 23 | 34.8% |
| 2 | 31 – 40 | 16 | 24.3% |
| 3 | 41 – 50 | 9 | 13.6% |
| 4 | 51--60 | 12 | 18.2% |
| 5 | 61-70 | 5 | 7.6% |
| 6 | >70 | 1 | 1.5% |
| Total | | 66 | 100% |

Male patients were predominating over the female in the study group, 56.1% megaloblastic anaemia patients were male and 43.9% was female.

Table 2: gender wised distribution of megaloblastic anaemia patients

| Gender | No. of cases | Percentage |
|---|---|---|
| Male | 37 | 56.1% |
| Female | 29 | 43.9% |
| Total | 66 | 100% |

Majority of the megaloblastic anaemia patients 68.2% (45) were pure-vegetarian while 31.8% (36) were taking mixed diet (vegetarian & non vegetarian both).

Table 3: dietary pattern of megaloblastic anaemia patients

| Diet | No. of cases | Percentage |
|---|---|---|
| Mixed | 21 | 31.8% |
| Pure vegetarian | 45 | 68.2% |
| Total | 66 | 100% |

According to the hemoglobin status, the maximum number of anemic patients (54.5%) belongs to moderate category, 33.3% patients have severe anemia and only 12.2% cases belong to mild category.

Table 4: Severity of Anemia (according to Hb %)

| Diet | No. of cases | Percentage |
|---|---|---|
| Mild (Hb>10%) | 8 | 12.2% |
| Moderate (Hb 7--10%) | 36 | 54.5% |
| Severe (Hb<7%) | 22 | 33.3% |

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Among the symptoms of megaloblastic anaemia weakness/fatigue was the most common (87.8%) presenting symptoms followed by anorexia (53.1%), swelling over the body (45.5%), weight loss (30.3%), fever (27.3%) and breathlessness in 21.2% cases.

Table 5: Distribution of megaloblastic anaemia cases as per presenting Symptoms

| Symptoms | Number | Percentage |
|---|---|---|
| Weakness/fatigue | 58 | 87.8% |
| Swelling over the body | 30 | 45.5% |
| Weight loss | 20 | 30.3% |
| Fever | 18 | 27.3% |
| Anorexia | 35 | 53.1% |
| Abdominal pain | 9 | 13.6% |
| Breathlessness | 14 | 21..2% |
| Urinary abnormalities | 4 | 6.0% |
| Neurological symptoms | 6 | 9.1% |

The common clinical findings observed in megaloblastic anaemia patients are pallor (100%), hepatomegaly (68.2%), edema (51.5%), hyper pigmentation (48.5%), splenomegaly (40.9%), jaundice (24.3%), glossitis (19.7%), neuropathy (16.7%) and Koilonychias was found in 13.6% of patients.

Table 6: Distribution of megaloblastic anaemia cases as per presenting Signs

| Symptoms | Number | Percentage |
|---|---|---|
| Pallor | 66 | 100% |
| Glossitis | 13 | 19.7% |
| Neuropathy | 11 | 16.7% |
| Edema | 34 | 51.5% |

| | | |
|---|---|---|
| Hepatomegaly | 45 | 68.2% |
| Splenomegaly | 27 | 40.9% |
| Jaundice | 16 | 24.3% |
| Hyper pigmentation | 32 | 48.5% |
| Koilonychias | 9 | 13.6% |

**Discussion**

Vitamin B12 deficiency may present with variable clinical manifestations, but the most common presentation is megaloblastic anemia. Folate deficiency is also another important cause of megaloblastic anemia. In this study, the most common age of presentation of megaloblastic anemia was in the subjects aged 16–30 years, our finding was comparable with the Kaur et al [10] and Khanduri et al [11], which suggest that MA is more prevalent in young age Present study observed slight male predominance (56.1%) over the female (43.9%) of the megaloblastic anaemia patients, Our result was similar to Ratre BK, et al [12], Rawat S et al [13] and Gupta M et al [14] In present study most of the (54.5%) megaloblastic anemia patients were moderate in nature (Hb 7—10%), our finding was concordance with the *Choudhary P* et al [15] and Mishra R et al [16] Current study observed megaloblastic anaemia was higher among pure vegetarian persons, similar finding also found by Gupta RK et al [17] and KK Magnani, et al [18].

Strict vegetarians are at high risk as vitamin B12 does not occur in vegetable and fruits. Gastric atrophy, malabsorption and deficiency of intrinsic factors (required for vitamin B12 absorption) are the reasons for developing MA In our study common symptoms of megaloblastic anaemia were weakness, fatigue, anorexia, swelling all over the body and exertional dysnoea these finding correlate with previous studies: Vikas J et al [19], Clarke R et al [20], Yellinedi S,et al [21] and S. Srikanth et al [22]. Pallor was present in all the patients in our study, and this was comparable to the survey by Gayathri BN et al [23], Rathwa SS et al [24]. In present study splenomegaly was seen in 40.2% cases, accordance with the Rawat S, et al [25], observed splenomegaly in 35.3% of megaloblastic anaemia cases. In this study, observed the common clinical signs were pallor, glossitis, edema, jaundice, hepatomegaly, splenomegaly and hyper pigmentation, comparable with the Deepankar P, et al [26], B.R. Pokharel et al [27]

**Conclusion**

Incidence on megaloblastic anemia was 26.4%, highest in the subjects aged between 16 to 30 years. Predominantly occurs in pure-vegetarian populations. Most of the patients were reported moderate to severe anaemia. The most common presenting complaint in megaloblastic anemia was generalized weakness/ fatigue, anorexia, edema, and weight loss. Common clinical finding were pallor, hepato-splenomegaly and hyper pigmentation. Megaloblastic anemia is a preventive and treatable condition.

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