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Clinical & Haematological Profile of Megaloblastic Anemia- A Retrospective Study

KEYWORDS: megaloblastic anemia, macrocytosis

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ABSTRACT *Megaloblastic anemia is characterised by decreased haemoglobin level with elevated mean corpuscular volume (MCV)1,2. Patients may present with general symptoms of anemia, sometimes neurological involvement. Deficiency of vitamin B 12 or folic acid which leads to impaired DNA synthesis gives rise to macrocytic RBCs, ineffective erythropoiesis & intramedullary haemolysis1,2. This leads to rise in unconjugated billirubin, LDH & also variable degree of cytopenias.*

Aims & Objectives: To study various symptoms, clinical findings & haematological parameters of megaloblastic anemia.

Materials & methods: This was a retrospective observational type of study. The study was conducted on patients admitted in medicine department of SKN Medical College & General Hospital, Pune during period Jan 2014 to Oct 2014. The case records of 220 patients of anemia were reviewed & 30 cases of megaloblastic anemia were selected for the study. Patients with diagnosis of megaloblastic anemia, Hb <10gm% & MCV 100fl were selected for the study. Their records were reviewed. Data was collected in terms of clinical findings & laboratory parameters. All cell counts were done on automated coulter machine & peripherals smear reported by pathologist. Data was analysed using standard statistical tests. Results are presented in form of tables & graphs.

Conclusion: Megaloblastic anemia has wide clinical & haematological spectrum. Thorough clinical assessment, good examination of peripheral smear is vital for diagnosis. Findings of pallor, icterus & leukopenia, thrombocytopenia are commonly seen in our study.

Introduction: Anemia is a common problem in our population. According to WHO anemia is defined as Hb < 13 gm% in males, Hb < 12 gm% in females & Hb < 11 gm% in pregnant females[3]. Based upon RBC morphology anemia is classified as Normocytic, Microcytic & Macrocytic (or megaloblastic). Megaloblastic anemia is characterised by macrocytosis, anisocytosis & poikilocytosis. MCV in megaloblastic anemia is $\geq$ 100 fl[1-3]. Causes of megaloblastic anemia are Vit. B12 or folic acid deficiency or abnormality of their metabolism. Important clinical conditions leading to megaloblastic anemia are recurrent diarrhoea, malabsorption syndromes, worms, GI surgery, nutritional – strict vegans, chronic liver disease, drugs like methotrexate, chemotherapeutic agents, anticonvulsants, proton pump inhibitors, prolong antibiotic use, metformin, alcohol etc. Vit. B12 & folic acid are important for DNA & RNA synthesis[4]. Their deficiency causes ineffective erythropoiesis & intramedullary haemolysis. This ultimately results in megaloblastic changes. Other features are variable degree of leukopenia, thrombocytopenia, and hypersegmented neutrophils on peripheral smear. Unconjugated billirubin & serum LDH are raised. Bone marrow is usually hypercellular with accumulation of primitive cells[5]. Patients usually present with general symptoms like shortness of breath, easy fatigue, decreased appetite, weakness, oedema over feet. On examination they have pallor, sometimes glossitis, icterus, hepato-splenomegaly or feature of congestive heart failure. Small subset of patients have neurological involvement due to demyelination. The neurological manifestations include peripheral neuropathy, ataxia, gait abnormality, dementia & mental changes. The patients should be investigated for sr. B12 & folic acid acid level. They usually require high doses of deficient vitamin or both. Response to therapy with vitamins & supportive care is generally good[2,5].

Aims & Objectives: 1) To study various symptoms & clinical findings in patients of megaloblastic anemia. 2) To study various haematological parameters in patients of megaloblastic anemia.

Materials & methods: This was a retrospective observational type of study. The study was conducted on patients admitted in medicine department of SKN Medical College & General Hospital, Pune during period Jan 2014 to Oct 2014.The case records of 220 patients of anemia were reviewed & 30 cases of megaloblastic anemia were selected for the study. Since anemia is extremely common in our population, we included patients with Hb < 10 gm%.

Inclusion criteria: Patients with diagnosis of megaloblastic anemia, Hb <10gm% & MCV $\geq$100 fl.

Cases fulfilling above criteria were selected for the study. Their records were reviewed. Data was collected in terms of clinical findings & laboratory parameters. All cell counts were done on automated coulter machine & peripherals smear reported by pathologist. Data was analysed using standard statistical tests. Results are presented in form of tables & graph.

Results: The study consists of 30 patients of megaloblastic anemia, Males & Females being equal in no. Male to female ratio 1:1. The age varied from lowest 16 yrs to highest 78 yrs. Mean age was 48.33 $\pm$ SD of 18.90. The age wise distribution is shown in graph I.

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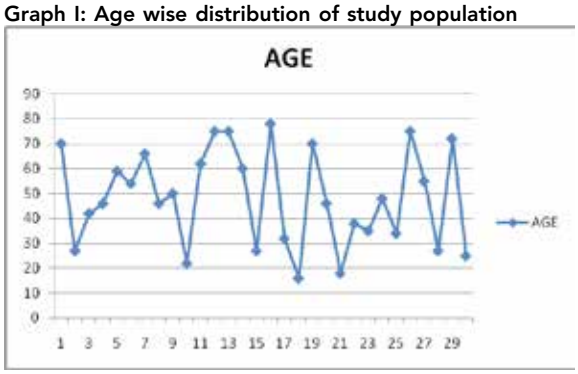
Graph I: Age wise distribution of study population



Frequency of different clinical features in the study population is shown in the table below.

Table I: Frequency of different clinical features:

Symptom	No. Of cases	Percentage (%)
General Symptoms	22	73.33
Neurological involvement	02	6.67
Pallor	30	100
Jaundice	10	33.33
Hepatomegaly	07	23.33
Splenomegaly	07	23.33

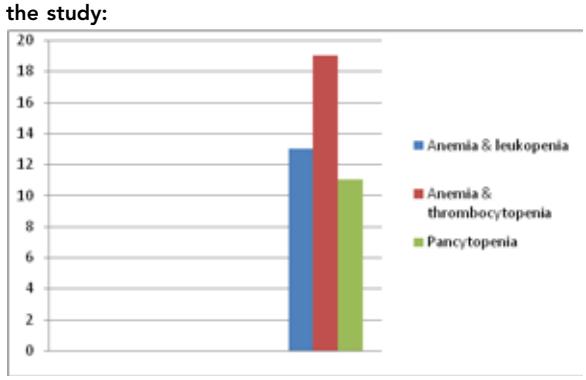
General symptoms like easy fatigue, shortness of breath, oedema, weakness were present in 22 (73.33%) patients. Pallor was present in all patients as in most of the studies. Clinical jaundice was seen in 1/3 study population. These patients had predominantly high unconjugated bilirubin indicating intramedullary haemolysis. Hepatomegaly & splenomegaly was present in 07 (23.33%) patients each. Neurological involvement was not common in our study, found in only 02 (6.67%) patients. These clinical findings are comparable other studies like Hirachand S[3], Vineetha Unnikrishnan[6] & Muhammad Bilal Khattak[7].

Distribution of various laboratory parameters is shown in following graph & tables.

Table II: Frequency of pancytopenia & bicytopenias in the study:

Lab. parameter	No. Of cases	Percentage (%)
Pancytopenia	11	36.67
Bicytopenia (anemia, leukopenia)	13	43.33
Bicytopenia (anemia, thrombocytopenia)	19	63.33

Graph II: Frequency of pancytopenia & bicytopenias in the study:



Peripheral smear examination showed low haemoglobin with macrocytic RBCs along with anisocytosis & poikilocytosis. 13 (43.33%) patients had hypersegmented polymorphs on smear. Leukopenia was seen in 13 (43.33%) patients. Lowest leukocyte count in our study population was 1800/cmm. Thrombocytopenia was seen in 19 (63.33%) patients. However none had reported significant abnormal bleeding contrasting to other studies. 11 (36.67%) patients had pancytopenia.

Table III: Various lab parameters in the study population:

Lab. parameter	Mean
Hb	6.41 gm%
TLC	4987/cmm
Platelet count	1,53000/cmm
MCV	115 fl
Sr. LDH	2927.75

Mean haemoglobin in the study population was quite low (6.41 gm%). This is probably because this is a tertiary care hospital & only inpatients were included in the study. Mean MCV of all patients was 115 fl. In the study conducted by Hirachand S[3] & others, the frequency of cytopenias was lower than our study where as Vineetha Unnikrishnan[6] & others reported more frequent cytopenias. Muhammad Bilal Khattak[7] reported much higher occurrence of pancytopenia, although mean values of Hb, leukocyte & platelet count were similar to our study. Interesting finding in the study was that mean sr. LDH was high – about 5 to 6 times the upper limit of normal. Out of total 30 patients sr. LDH was measured for 17 patients & it was elevated in 15 patients (88%). Similar finding has been shown in other studies[8].

Conclusion: Megaloblastic anemia has wide clinical & haematological spectrum. Thorough clinical assessment, good examination of peripheral smear is vital for diagnosis. Findings of pallor, icterus & leukopenia, thrombocytopenia are commonly seen in our study.

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