



MICROCYTIC ANAEMIA AND ITS DIFFERENTIAL DIAGNOSIS: OBSERVATIONS AT TERTIARY CARE HOSPITAL

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ABSTRACT **Objective:** To evaluate various investigations in microcytic anaemia and to correlate them with other parameters. To provide specific etiological diagnosis in all cases of microcytic anaemia. To determine the incidence of different aetiologies of microcytic anaemia in patients admitted to this hospital. **Method:** Complete blood count, Peripheral Blood smear examination by Giemsa stain, Iron profile, Bone marrow examination and haemoglobin electrophoresis. **Results:** IDA more common in young females while Thalassemia common in males. Peripheral smear and serum ferritin level is more valuable in differential diagnosis. **Conclusion:** Increase RDW and serum Ferritin level are sensitive parameter for diagnosis of Microcytic Hypochromic Anaemia.

KEYWORDS : IDA, Microcytosis, hypochromia, RDW, Serum Ferritin and Electrophoresis.

INTRODUCTION

Anemia is defined as the hemoglobin concentration or hematocrit below the lower limit of the 95% reference interval for the individual age, sex and geographic location.²⁶

Functionally anemia is defined as insufficient RBC mass to adequately deliver oxygen to peripheral tissues. Anemia is not a diagnosis in itself but is merely an objective sign of presence of disease. The diagnosis of anemia should be approached on a step by step basis. Basic steps are:

1. Evaluation of clinical information from a review of the history and physical examination.
2. Examination of peripheral blood smears and various hematological indices like Hb, MCV, MCH, MCHC, RDW and Reticulocyte count.
3. Determination of serum iron and total iron binding capacity.
4. Examination of aspirate bone marrow when necessary.
5. Specialized laboratory procedure when necessary for making definitive diagnosis.

Differential diagnosis of microcytic anemia is based on above described steps. Microcytosis as well as hypochromia constitutes primary feature evidence that hemoglobin synthesis is impaired. The degree of microcytosis and hypochromia relates to both the severity and duration of underlying disorder.

The present study was undertaken for differential diagnosis of microcytic anemia using routine as well as specialized laboratory procedures where necessary. The response to iron therapy in iron deficient individual can be judged by serial study of erythrogram of patient, thereby providing the utility of this parameter.

The present study stresses the importance and utility of these parameters in patient of microcytic anemia.

AIM AND OBJECTIVE

Aim:

- 1) To evaluate various investigations in microcytic anaemia and to correlate them with other parameters.
- 2) To provide specific etiological diagnosis in all cases of microcytic anaemia.
- 3) To determine the incidence of different aetiologies of microcytic anaemia in patients admitted to this hospital.

Objective:

- 1) To determine response to iron therapy in iron deficient individual by serial study of erythrogram of patient.
- 2) To determine the importance and utility of parameters in patient of microcytic anemia.

MATERIAL AND METHODS:

Study setting- The study was conducted at SMIMER (tertiary care center), Surat, Gujarat, India.

Study Design- Prospective observational study.

Inclusion Criteria:

- 1) All samples received from OUT and IN- patient department of SMIMER hospital having hematological indices like low Hb, MCV, MCH, MCHC, RDW and Reticulocyte count.
- 2) Degree of microcytosis observed from peripheral smear and MCV < 80 fl were the two criteria applied for case selection.

Exclusion Criteria:

Samples having normal peripheral blood smear findings and improper collection.

RESULTS AND DISCUSSION:

Table:1 Socio-demographic Profile Of Study Population.

	Iron deficiency anemia n=66	Anemia of chronic disease n=10	Thalassemia n=24
Age (years)			
<20	40(61%)	1(10%)	22 (91%)
>20	26 (39%)	9 (90%)	2 (9%)
Sex			
Male	20 (30%)	7 (70%)	20 (83%)
Female	46 (70%)	3 (30%)	4 (17%)

The present study consisted of Total 100 cases of which 66% cases were of Iron deficiency anemia, 10% of cases were of anemia of chronic disorder and 24% cases were of Thalassemia. The present study consisted of 100 cases out of which 30% were males and 70% were females.

Iron deficiency anemia was more common in Reproductive female. Anemia of chronic disease and Thalassemia was observed to be more common in males.

Table:2 Distribution Of Study Population According To The Peripheral Smear In Microcytic Anemias.

Condition	Anisocytosis poikilocytosis	Basophilic stippling	Target cells	Dimorphism
Iron deficiency anemia	66	0	5	30
Anemia of chronic disease	8	01	1	6
Thalassemia	24	20	24	0

In the present study, out of 66 cases of iron deficiency anemia, all the cases showed mild to severe degree of anisopoikilocytosis depending on the haemoglobin concentration and in 5 cases target cell were present. 30 cases show dimorphism. Basophilic stippling was not observed in smear.

Out of 10 cases of anemia of chronic disease, 8 of them showed anisopoikilocytosis and 1 showed target cells and 1 showed basophilic stippling 6 dimorphism. From 24 cases of thalassemia in All 24 cases anisopoikilocytosis and target cells was present. In the 20 smear, basophilic stippling were present but none of them showed dimorphism.

Table:3 Distribution Of Study Population According To Their Findings Of S.ferritin And Iron Binding Capacity.

	Iron deficiency anemia n=66	Anemia of chronic disease n=10	Thalassemia n=24
S.Ferritin (µg/L)			
0-11	66 (100.0%)	NIL	NIL
12-300	NIL	9 (90%)	20 (83%)
>300	NIL	1 (10%)	4(17%)
Iron Binding Capacity (µg/L)			
0-249	0	2 (20%)	0
250-400	0	8 (80%)	24 (100.0%)
>400	66 (100.0%)	0	0

Normal range Serum Ferritin 12-300 µg/L

In the present study out of 66 cases of iron deficiency anemia all were ferritin deficient, with a mean of about 6.61 µg.

Out of 10 cases of anemia of chronic disease, in 9 cases S.ferritin was within normal range and 1 cases showed values above the normal range.

In the present study, in all cases of iron deficiency anemia and Anemia of chronic disease, S.iron was lower than normal. All cases of thalassemia had S.iron within normal limits.

Normal range: Total Iron Binding Capacity 250-400 µg/dl.

Total iron binding capacity among all the cases of iron deficiency anemia was more than normal range. In 2 cases of anemia of chronic disease, total iron binding capacity was lower than the normal range and 8 cases were within the normal range of total iron binding capacity.

Findings are similar to that described by Bain Barbara J.¹**CONCLUSION:**

In the present study 39% incidence of iron deficiency anemia occurred in more than 20 years of age group while 61% in less than 20 years age group. In the same way 90% cases of anemia of chronic disease were of more than 20 years of age group and 10 % were of less than 20 years age group. Incidence of thalassemia in less than 20 years age group was 91% while it was 9% in more than 20 years age group.

Cunningham Lydia O. and Rising Jame A.³ 100 cases out of which 59% cases where of iron deficiency anemia, 16% cases of thalassemia, 13% cases of anemia of chronic disease and 6% cases of unknown reason.

Cunningham and Rising³ reported 31 cases of females of iron deficiency anemia among 59 cases, and 11 males of thalassemias. Out of 16 cases Okuno Takashi and Chou Adam³⁸ observed 31 males and 45 females, of iron deficiency anemia among 76 cases, and 31 males and 19 cases of thalassemia among 50 cases.

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