

## A Descriptive Study on Morphological Pattern of Anemia among Patients Attending Tertiary Care Hospital in Chennai

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### Abstract

*Background:* Anemia has a significant health burden in developing nation. Etiology is determined by looking at the morphology of R.B.C which determines the degree of hemoglobinization.

*Aims and objectives:* To determine the morphological patterns of anemia and its prevalence in various age groups.

*Materials and methods:* This was a descriptive study done on patients who attended clinical pathology department during January 2017–December 2017 in A.C.S. Medical College and Hospital, Chennai. Complete hemograms of 760 patients were analyzed. This study was approved by the institutional ethical committee.

*Result:* Of the total 760 hemograms, 470 were anemic with a prevalence of 61.8%. This study showed a female preponderance with 65.9%. The most common morphologic pattern of anemia in the present study was microcytic hypochromic, followed by macrocytic and dimorphic. The prevalence of microcytic hypochromic anemia was 46.8% (n=220), followed by macrocytic 31.9% (n=150) and dimorphic 21.2% (n=100) respectively. In females most of the anemias (microcytic, macrocytic and dimorphic) presented between the age group of 20-30 years. In males microcytic anemia was prevalent in 31-40 years whereas dimorphic and macrocytic anemias were prevalent above the age of 50 years

*Conclusion:* Morphology of anemia by smear examination remains the baseline tool for diagnosing anemia. Morphological patterns determine the underlying cause. Peripheral Smear examination being less expensive reduces the financial burden to the patient and this tool being mandatory in evaluation of anemias, helps physician in early diagnosis of anemia and prevent the complications of anemia.

**Keywords:** R.B.C-Red Blood Cells; HB-Hemoglobin.

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**Introduction**

Anemia has a significant health burden in developing nation [1,2]. Anemia cut off depends on variables such as biologic age, sex, race and altitude above sea level, pregnancy, smoking status and others [3]. Most references consider HB concentration of 14g/dl and 12g/dl as the lower limit of normal at sea level in adult men and women respectively [4]. Etiology is determined by looking at morphology of R.B.Cs which include red cell size as normocytic, microcytic (or) macrocytic (or) hyperchromic which determines degree of hemoglobinization [5]. To identify the cause of anemia, information from the medical history and physical examination must be integrated with some key laboratory tests [6]. In India and other developing countries, prevalence of nutritional anemia in reproductive age group ranges from 60-80% compared to 10-20% in developed countries [7]. The automated analysis of blood has made the erythrocyte indices more accurate and reproducible [8]. Notable signs of anemia include paleness of skin and mucous membrane. Specific features are related to specific causes such as koilonychias in iron deficiency and atrophic glossitis in megaloblastic anemia.

**Materials & Methods**

This was a descriptive study done on patients who attended clinical pathology department during January 2017–December 2017 in ACS Medical College and Hospital, Chennai. A thorough clinical examination was elicited, with aseptic precautions venous blood samples were collected from the patients in an EDTA anticoagulant tube by a phlebotomist. Complete blood counts were done by using automated hematology analyzer (sysmex kx 21). All peripheral blood films were prepared manually, stained by leishman stain by a trained person and were examined by a pathologist. Under oil immersion red cell morphology, white blood cell distribution and adequacy of the platelets were observed. Patients below 14 yrs of age, anemia due to hematologic malignancies and patients on blood transfusion were excluded from the study.

**Results**

Total number of hemograms in the present study were 760, out of which 470 were anemic with a prevalence of 61.8%. This study noted a female preponderance with 65.9% (n=310) and male were accounting for 34.1% (n=160). In females most cases were observed between the age group of 20-30 yrs (n=155) 50%, whereas in males most of the anemic cases were seen above the age group of 60 yrs (n=60) 37.5%. The most common morphologic pattern of anemia in the present study was microcytic hypochromic, followed by macrocytic and dimorphic. The prevalence of microcytic hypochromic anemia was 46.8 % (n=220), followed by macrocytic 31.9 % (n=150) and dimorphic 21.2 % (n=100) respectively. In females prevalence of microcytic hypochromic anemia was 86.3% (n=90) and in males it was 13.6% (n=30), macrocytic anemia was prevalent in males with 60% (n=90) whereas in females it was 40% (n=60). Prevalence of dimorphic anemia was more in females with 60% (n=60) and in males it was 40% (n=40). In microcytic hypochromic anemia MCV, MCH, MCHC were decreased and RDW was increased.

In dimorphic anemia MCV and MCH were decreased but MCHC and RDW was normal. In macrocytic anemia MCV and RDW are increased but MCHC was normal.

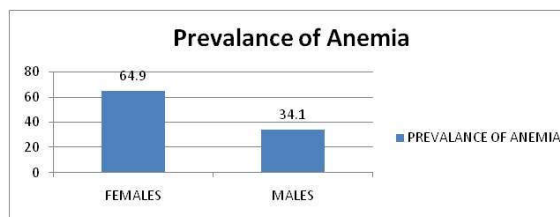


Fig. 1:

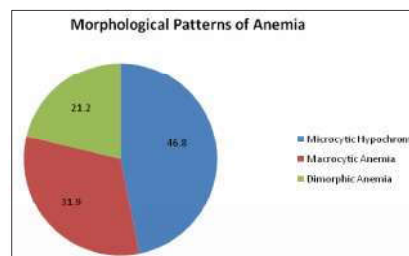


Fig. 2:

## Discussion

The mainstay of the present study was to emphasize the morphological patterns of anemia and its prevalence in various age groups. The prevalence of anemia in the present study was 61.8% among which 65.9% were females and 34% were males. The overall prevalence of anemia was similar to the studies conducted by Rana et al and Seshadri et al. [9,10]. National family health survey (NFHS-3) noticed a lower prevalence of anemia in females and males with 55% and 24% respectively [11]. In the present study most common morphological pattern of anemia was microcytic hypochromic followed by macrocytic and dimorphic anemia with 46.8%, 31.9% and 21.2%.

In a study by U. Parameshwar et al. microcytic hypochromic was the commonest pattern with 86%, macrocytic anemia was 4.9% and dimorphic anemia was 9.1% [12]

In other study done by M. Bukar et al [13] 2009 microcytic hypochromic anemia was the commonest pattern with 64.9% followed by dimorphic and macrocytic with 34.7% and macrocytic with 0.4%.

In females most of the anemias (microcytic, macrocytic and dimorphic) presented at the age group of 20-30 years. In males microcytic anemia was prevalent in 31-40 years whereas dimorphic and macrocytic anemias were prevalent above the age of 50 years.

## Conclusion

Morphology of anemia by smear examination remains the baseline tool for diagnostic evaluations, even though other investigations like immunophenotyping and flow cytometry are used for hematological malignancies. Clinicians should request blood smear examination when necessary. Morphologic patterns reflect the underlying cause. Iron deficiency anemia being the most common anemia in women in reproductive age group and adolescents basic peripheral smear examination can reduce the financial burden to the patient and help the physician in early detection and management of anemia.

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