A Study of Morphological Types of Anemia

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Abstract: *Anaemiais most often a sign of an acquired or genetic abnormality. It is one of the commonest manifestations of the underlying medical condition. Anaemiais functionally defined as an insufficient RBC mass to adequately deliver oxygen to peripheral tissues. Hb concentration estimation is the ideal and convenient way of detecting Anaemia. Other measurements which are also helpful are haematocrit and the RBC count.It is not enough to just report that patient has anaemia, but also morphological subtyping of anaemiais required, so that the clinician can be properly guided in the proper management and follow up of the patient and to suggest further.Anemia is a medical condition in which the hemoglobin (Hb) concentration and red blood cells (RBCs) count are lower than the normal range. The normal range of Hb and RBCs in general vary between males and females, it is defined as aHb level of <13.5 g/dl and <12.0 g/dl in adult males and females respectively. The main causes of anemia are a decrease in RBCs, insufficient Hb synthesis or increased RBCs destruction, and the primary cause is an iron deficiency.Anemia is the most common health issue in the world, and it affects a large population in almost all countries. The most frequent etiologies of anemia are nutritional deficiencies, malaria, parasitic infections, blood loss, bone marrow replacement, or suppression and hemoglobinopathies.This study is done to understand the different morphological types of anemia, their incidences in the common society so as to help the clinicians to understand better this disease and treat them adequately.*

Keywords: Anemia, Morphological Typing, Microcytic, Hypochromic, macrocytic

1. Introduction

Anemia is a medical condition in which the hemoglobin (Hb) concentration and red blood cells (RBCs) count are lower than the normal range. The normal range of Hb and RBCs in general vary between males and females, it is defined as aHb level of <13.5 g/dl and <12.0 g/dl in adult males and females respectively. The main causes of anemia are a decrease in RBCs, insufficient Hb synthesis or increased RBCs destruction, and the primary cause is an iron deficiency.[1] Anemia is the most common health issue in the world, and it affects a large population in almost all countries. The most frequent etiologies of anemia are nutritional deficiencies, malaria, parasitic infections, blood loss, bone marrow replacement, or suppression and hemoglobinopathies.[2,3]Arbitrarily, anemia may be classified as either moderate (7.0-10.0 g/dl) or severe (<7.0 g/dl).[4]The signs and symptoms of anemia are generally nonspecific, such as fatigue and weakness; it is often associated with gastrointestinal symptoms such as nausea, constipation, or diarrhea.[5,6] Normocytic hypochromic red cells have the central area of polar occupying about a third of the cell diameter and show reduced staining, with an increase in the central area of the pallor.[7] The morphological classification of anemia is based on morphological criteria of red cells in ideal thin blood film, and also on red cells indices, mean corpuscular volume (MCV), mean cell hemoglobin (MCH) and MCH concentration (MCHC).[8]

Anaemiais most often a sign of an acquired or genetic abnormality. It is one of the commonest manifestations of the underlying medical condition. Anaemiais functionally defined as an insufficient RBC mass to adequately deliver oxygen to peripheral tissues. Hb concentration estimation is the ideal and convenient way of detecting Anaemia. Other measurements which are also helpful are haematocrit and the RBC count.It is not enough to just report that patient has anaemia, but also morphological subtyping of anaemiais required, so that the clinician can be properly guided in the proper management and follow up of the patient and to suggest further. Haematological investigations for knowing the specific cause of anaemia. Morphologically, in peripheral blood smear examination, Anaemiacan be microcytic hypochromic type, macrocytic type, dimorphic type and normocytic and normochromic type. Each of these morphological types has varied aetiologies and can be known by correlating with patient's clinical history, clinical examination and by further suitable investigations. This helps the clinicians to know the common types and causes of anaemiain the community, which helps in taking appropriate measures to prevent the anaemia. This study is done to understand the different morphological types of anemia, their incidences in the common society so as to help the clinicians to understand better this disease and treat them adequately.

2. Aims and Objectives

To study the Morphological Types of Anemia.

3. Materials and Methods

This study was conducted in Father Muller Medical College.

This study was conducted from May 2009 to April 2011.

180 confirmed cases were selected randomly for this study. 90 were males and 90 were females in the study group.

All necessary aseptic precaution was taken and samples were collected randomly in EDTA vials. Detailed relevant history and clinical details were collected from patients. Samples were analysed for Hb% and when it was confirmed for anemia then the morphological typing was done.

4. Results

Table 1: Mean age of the population

	Males	Female
Age (mean)	31.27	26.35

Table 2: Frequency of different morphological Anemia

	Males	Female
Normocytic normochromic	21	38
Microcytic hypochromic	24	51
Macrocytic Anemia	45	11

Table 3: Association of Microcytic anemia in females

Frequency	p-value (<0.05)	Sig
51	0.004	Significant

Table 4: History of consumption of alcohol with macrocytic anemia in males

Frequency	H/O Consumption of Alcohol	Percentage
45	31	68.8%

Table 5: Association of Consumption of Alcohol with Macrocytic Anemia

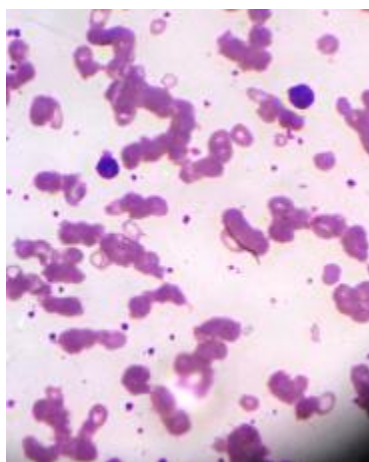| Frequency	p-value (<0.05)	Sig
31	0.003	Significant

5. Discussion
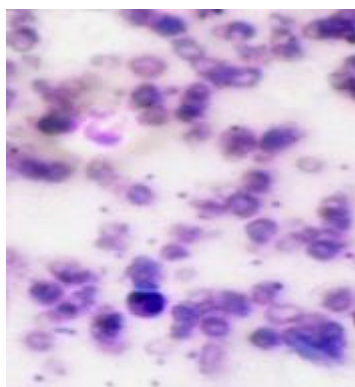

Image 1: Dimorphic Anemia

Image 2: Microcytic hypochromic Anemia

WHO defines the lower limit of normal for Hb concentration in adults to be 12.0 g/dL in women and 13.0 g/d Linmen. Anaemia is a common condition in the older population. Generally, in individuals over 65 years, 8.5% have a Hb concentration meeting the WHO definition of anaemia. Prevalence of anaemia rises steadily with age, increasing from about 10% in persons of 65 years and older, to about 20% in persons over 85 years.

Anaemia is a significant predictor of morbidity, mortality and quality of life in the elderly, as a general risk factor or in the setting of other clinical conditions like heart failure. In our study there is a strong association of microcytic and hypochromic anemias in females. This may be due to the fact that proper nutrition is still not available to the metabolic needs of the female. Iron deficiency anemia is one of the silent killers in India and is one of the most important factors of maternal and fetal morbidity and mortality in India. There is also a strong association of males being involved in alcohol consumption are more likely to develop anemia which is macrocytic in nature.

6. Conclusion

This study forms a foundation for the benefits of the practicing clinicians and helps them diagnose the different morphological types of anemias. This also help the practicing pathologists to differentiate different types of anemias which are more commonly found in the society.
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