

## ANALYSIS OF THE RELATIONSHIP BETWEEN CLINICAL RESULTS AND LABORATORY STUDIES OF ADULT PATIENTS WITH ANAEMIA IN TERTIARY CARE CENTER

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### Abstract

**Background:** Anaemia is a common public health concern linked to an raised risk of morbidity and mortality. 1.62 billion Individuals are anaemic worldwide, while the prevalence of anaemia is 47.4 percent among pre-school children. Aims and Objectives: Analysis of the relationship between clinical results and laboratory investigations in tertiary health care centres of adult patients with anaemia.

**Methodology:** This research was carried out over a period of two years in a tertiary healthcare centre within the Department of Pathology. 200 patients who were admitted for investigation and treatment of anaemia and who met the appropriate requirements were included in the study during this time. Adult males and females (15-60 years) were included in the sample with a haemoglobin level of less than 10 percent gm. All investigations were conducted as per the signs, such as USG, X-ray, CBC, Bone marrow, KFT, LFT, etc.

**Result:** We saw in our research that the majority of patients were in the 56-60 age range. The majority of patients had a Hb level of 2.1 percent to 4 gm. In 186, exhaustion was the commonest symptom, followed in 136 by dyspnea. Pallor in 200 was the most prevalent presenting sign. Diamorphic was the commonest type of anaemia-96% of the cases was followed by megaloblastic anaemia in 40% of the cases.

**Conclusion:** It can be inferred from our analysis that most patients were in the 56-60 age group. The commonest symptoms were anorexia, fatigue and dyspnea. Pallor & Oedema were the commonest presenting symptoms.

**Keywords:** Anaemia, Koilonychia, Hemoglobin.

### Introduction

Anaemia is a common public health concern linked to an raised risk of morbidity and mortality. 1.62 billion Individuals are anaemic worldwide, while the prevalence of anaemia is 47.4 percent among pre-school children<sup>1</sup>. Nutritional anaemia accounts for about half the global cases of anaemia in South Asia. In India, anaemia in young children, teenage girls, and pregnant women continues to be the biggest health concern. Nutritional anaemia affects approximately 50 percent of the population, as is known in countries where meat intake is limited<sup>2-4</sup>. In the form of recurrent systemic inflammation, chronic disease anaemia occurs and is associated with low serum iron, decreased total iron-binding ability, and abundant stored iron in tissue macrophages. Anaemia is characterised as a condition where the haemoglobin content is below average, according to the World Health Organization (WHO). Because of various pathophysiological processes, this condition happens<sup>5</sup>. If the amount of

haemoglobin or packed cell volume (PCV) is below the lower limit of normal for the same age and sex, anaemia occurs. Anaemia has multiple classifications. One is based on the underlying mechanism, and secondly, the clinically useful approach classifies anaemia according to changes in the morphology of red cells, which also suggest unique causes<sup>6</sup>. Red cell size (normocytic, microcytic, or macrocytic); degree of hemoglobinization, expressed in red cell colour (normo-chromic or hypo-chromic); and shape are morphological characteristics that include etiologic clues. Microcytic hypo-chromic anaemias are typically induced by haemoglobin synthesis disorders (commonestly iron deficiency), while macrocytic anaemias are often caused by anomalies that affect the bone marrow maturation of erythroid precursors<sup>7</sup>. Nutritional deficiencies (malnutrition and iron, vitamin B12, and folic acid deficiency) and chronic diseases are the most prevalent types of anaemia (such as cancer, kidney disease and congestive heart failure). There are two billion individuals with anaemia in the world, according to the World Health Organization

(WHO and half of the anaemia is due to iron deficiency<sup>8</sup>. Whatever the origin, anaemia leads to some clinical findings when sufficiently serious. They appear pale in patients. Popular complaints are exhaustion, malaise, and basic fatigue<sup>9</sup>. The decreased oxygen content of the circulating blood allows moderate exercise to induce dyspnea. In the liver, myocardium, and kidneys, hypoxia can cause fatty changes.

### Material and Methods

This research was conducted over a period of two years in a tertiary health care centre under the Pathology Department. During this time, 200 individuals who were admitted for anaemia

investigation and treatment and who met the requirements needed were included in the sample. Adult males and females (15-60 years), haemoglobin levels of less than 10gm percent were included in the study, while patients with acute illness such as sepsis and terminally ill patients, morbid patients and patients not willing to examine were removed from the study when they were less than 15 years and more than 60 years of age. All investigations were conducted as per the signs, such as USG, X-ray, CBC, Bone marrow, KFT, LFT, etc.

### Results

**Table 1: Age and Sex Incidence**

Age group (years)	No of cases		Total
	Male	Female	
15-20	8	12	20
21-25	10	12	22
26-30	8	8	16
31-35	8	10	18
36-40	12	4	16
41-45	6	14	20
46-50	14	4	18
51-55	14	6	20
56-60	32	18	50
Total	112	88	200

Most patients were in the 56-60 year age group, i.e. 50 years followed by 21-25 years were 22, 15-20 years and 51-55 years were 20, 26-30 years and 35- 40 years were 16, 46-50 years were 18 years.

**Table 2: Showing No. of cases with Hemoglobin Level**

Hb concentration in gm %	No. of cases
Upto 2	4
2.1- 4	70
4.1- 6	64
6.1-8	32
8.1-10	30

The majority of patients were (70 percent) with Hb level 2.1 to 4 gm, followed by 4.1-6 gm, 64 percent, 6.1-8 gm, 32 percent, 8.1 to 10 gm, 30 percent.

**Table 3: Presenting Symptoms**

Symptoms	No. of cases
Fatigue	186
Dyspnoea	136
Anorexia, weight loss	108
Gastrointestinal symptoms	52
Bleeding manifestations	18
Swelling of face & feet	42

The commonest symptoms were fatigue in 186, dyspnea in 136, anorexia and weight loss in 108, and gastrointestinal symptoms in 52, bleeding in 42, and swelling of the face and feet in 42.

**Table 4: Presenting signs**

Signs	No. of cases
Pallor	200
Oedema	42
Koilonychia	34
Haemic murmur	30
Tingling/ paraesthesia	24
Icterus	16
Stomatitis/ glossitis	12
Splenomegaly	12
Lymphadenopathy	8
Hepatomegaly	8
Knuckle pigmentation	4

Pallor in 200, accompanied by Edema in 42, Koilonychia in 34, Hemic murmur in 30, Tingling/ Paraneesthesia in 24, Icterus in 16, Stomatitis/Glossitis in 12, Splenomegaly in 12, Lymphadenopathy in 8, Hepatomegaly in 8, Knuckle pigmentation in 4, were the commonest presenting sign.

**Table 5: Types of Anaemia**

Type	Percentage
Diamorphic	96
Megaloblastic anemia	40
Iron deficiency anemia	32
Leukemia	14
Anemia of chronic disorder	10
Multiple myeloma	2
Hypoplastic anemia	2
Idiopathic thrombocytopenic purpura	4

Diamorphic type 96 was the commonest type of anaemia, followed by megaloblastic anaemia in 40, iron deficiency anaemia in 32, leukaemia in 14, chronic disease anaemia in 10, and chronic disorder anaemia in 10, and idiopathic thrombocytopenic purpura in 4 cases.

### Discussion

Anaemia, which affects about a third of the global population, is the commonest blood disorder. Anaemia with iron deficiency affects nearly 1 billion individuals. Anaemia due to iron deficiency caused approximately 183,000 deaths in 2013, down from 213,000 deaths in 1990. During pregnancy, it is more common in women than in men, and in children and the elderly. Anaemia raises medical care costs and decreases the efficiency of an individual by decreasing his or her ability to function<sup>10</sup>. The three major forms of anaemia are due to blood loss, reduced development of red blood cells, and raised breakdown of red blood cells. Causes of blood loss include, among others, trauma and gastrointestinal bleeding. The causes of reduced development include iron deficiency, vitamin B12 deficiency, thalassemia, and a number of bone

marrow neoplasms. A variety of genetic disorders, such as sickle cell anaemia, infections such as malaria, and some autoimmune diseases, are causes of raised breakdown. Based on the size of red blood cells and the amount of haemoglobin in each cell, it can also be graded. It is microcytic anaemia if the cells are small. It is macrocytic anaemia if they are large, and normocytic anaemia if they are normal in size<sup>11</sup>. Diagnosis in men is based on less than 130 to 140 g/L haemoglobin (13 to 14 g percent), while in women it must be less than 120 to 130 g/L haemoglobin (12 to 13 gm percent). To determine the cause, further testing is then required. In our study, we found that the majority of patients were in the age group, i.e. 60 years, 50 years, 21-25 years, 22, 15-20 years, 55-60 years, 20, 26-30 years, 35-40 years, 16, 46-50 years, 14 years. The majority of patients were 70 percent with Hb level 2.1 to 4 gm, followed by 4.1-6 gm, 64 percent, 6.1-8 gm, 32 percent, 8.1 to 10 gm, 30 percent. The commonest signs were fatigue in 186, dyspnea in 136, anorexia and weight loss in 108, gastrointestinal symptoms in 52, bleeding in 42, swelling of the face and feet in 42. Pallor in 200, accompanied by Oedema in 42, Koilonychia in 34,

Haemic murmur in 30, Tingling/ Paraesthesia in 24, Icterus in 16, Stomatitis/Glossitis in 12, Splenomegaly in 12, Lymphadenopathy in 8, Hepatomegaly in 8, Knuckle pigmentation in 4, were the commonest presenting symptoms. Diamorphic in 96 was the commonest type of anaemia, followed by Megaloblastic in 40. Iron deficiency anaemia in 32, leukaemia in 14, chronic disease anaemia in 10, chronic disorder anaemia in 10, thrombocytopenic idiopathic purpura in 4 cases. This was similar to Chandurkar M, with the highest number of cases seen in >40 years having been identified out of 200 cases. There were 128 (64 percent). The most common symptom was easy exhaustion, which was present in 190 (80 percent of patients, accompanied by breathlessness in 132 (76 percent) and Pallor in 188 (94 percent), Venous hum in 88 (44 percent), Pedal edoema in 80 (40 percent), symptoms of heart failure in 80 (40 percent) (40 percent). Microcytic hypochromic in 84 (42 percent) and Dimorphic in 544 were the commonest form of anaemia seen from peripheral blood smear (27 percent). The proportion of Platyonychia in all forms of anaemia was highly important compared to Koilonychia<sup>12</sup>.

### Conclusion

It can be inferred from our analysis that most patients were in the 56-60 age group. The commonest symptoms were anorexia, fatigue and dyspnea. Pallor, Oedema, Koilonychia were the most prominent presenting symptoms. The main challenges to the efforts in place to avoid anaemia are unfavourable sociodemographic variables. Educating women alone will not bring about any desirable improvement, but growing the family's degree of literacy will undoubtedly help solve this issue. Equally significant variables are the educational status of the husbands and the women as it makes the couple open to the health staff's advice. Therefore in antenatal clinics, there is a need for dietary counselling and nutritional education to resolve the problem of pregnancy anaemia with missionary zeal, creative approach, and evidence-based approaches.

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