

## Prevalence of anemia in patients with various clinical condition in a private hospital

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### ABSTRACT

The objective of the study is to evaluate the prevalence of anemia in a large population of patients in a Multispeciality Hospital. A Retrospective study was carried out at Vivekanandha Medical Care Hospital, Tiruchengode. The study was conducted for 6 months. It was done in anemic patients with various clinical conditions. The patients details and prescriptions were analyzed and it was attached to the data analysis form Microsoft excel 2019 was used to analyze the data. In this Folic acid was utilized by the patients having anemia with stroke. Drugs like pantoprazole, amlodipine was utilized by the patients having anemia with Hypertension. Drugs like ranitidine, amlodipine was utilized by patients having anemia with Diabetes Mellitus. The major co-morbidity of anemia was Hypertension and Diabetes Mellitus. The age of the population was between 15-95 years. The prevalence was higher in male than female with Hypertension and Diabetes Mellitus. This study provides additional knowledge to the Healthcare providers to improve the health, recommended that the primary healthcare to be strengthened and high priority should be given to aspects such as prevention, early diagnosis and treatment of anemia.

**Keywords:** Anemia, Retrospective studies, Haemoglobin

### INTRODUCTION

Anemia, is defined as a hemoglobin (Hb) concentration < 12 g/dl for women and < 13.5 g/dl for men. The European Best Practices Guidelines for the Management of Anemia in Patients with various clinical condition defines anemia according to age and sex. Anemia is defined as an hemoglobin concentration of < 11.5 g/dl in women, < 13.5 g/dl in men < 70 years of age, and < 12 g/dl in men > 70 years of age. Anemia, as defined by World Health Organization (WHO) criteria less than 130 g/L for men and less than 120 g/L for women, is a common blood disorder [1,2] and it is a condition in which the number of red blood cells (RBCs) is inadequate to meet the physiologic needs of the human body.

### Hemoglobin

Hemoglobin is the oxygen-carrying protein contained in red blood cells that ensure delivery of inspired oxygen from lungs to all tissue cells. This process depends on oxygen forming a reversible ionic link with ferrous iron (Fe<sup>++</sup>) contained within the hemoglobin molecule. Methemoglobin (MetHb) is a dysfunctional form of hemoglobin (Hb) that cannot bind and transport oxygen because the iron it contains is in the oxidized, ferric (Fe<sup>+++</sup>) rather than the reduced, ferrous (Fe<sup>++</sup>) state.

In health, methemoglobin comprises no more than around 1 % of total hemoglobin. Methemoglobinemia is a potentially fatal condition characterized by increased methemoglobin concentration and consequent reduced blood oxygen transport and, thereby, reduced tissue oxygenation (hypoxia).

## IMPORTANCE OF HEMOGLOBIN

- Impact red color to the blood.
- Helps to carry out the oxygen and other gases assisting the respiratory system.
- It buffers the blood pH and maintain it to the tolerable limit.
- Genetic resistance to malaria.
- Hemoglobin is a blood test that measures the number of red blood cells in the body. It is measured in grams of hemoglobin per litre of blood.
- Normal hemoglobin for men is 135 to 170 and for women is 120 to 160.
- If hemoglobin becomes seriously low (around 70 to 80) blood transfusion is required.
- Iron is one of the ingredients the body needs to make hemoglobin.
- Ferritin is a blood test that measures iron stored in the body. Normal ferritin is about 35 to 300 micrograms per litre

## PREVALENCE

Prevalence is the proportion of a population who have a specific characteristic in a given time period.

### How is Prevalence Estimated?

- To estimate prevalence, researchers randomly select a sample (smaller group) from the entire population they want to describe. Using random selection methods increases the chances that the characteristics of the sample will be representative of (similar to) the characteristics of the population.
- For a representative sample, prevalence is the number of people in the sample with the characteristic of interest, divided by the total number of people in the sample.
- To ensure a selected sample is representative of an entire population, statistical 'weights' may be applied. Weighting the sample mathematically adjusts the sample characteristics to match with the target population.

$$\text{Prevalence} = \frac{\text{No of people in sample with characteristic}}{\text{Total no of people in sample}}$$

## TYPES OF ANEMIA

### Iron deficiency anemia

This most common type of anemia is caused by a shortage of iron in your body. Your bone marrow needs iron to make hemoglobin. Without adequate iron, your body can't produce enough hemoglobin for red blood cells.

Without iron supplementation, this type of anemia occurs in many pregnant women. It is also caused by blood loss, such as from heavy menstrual bleeding, an ulcer, cancer and regular use of some over-the-counter pain relievers, especially aspirin, which can cause inflammation of the stomach lining resulting in blood loss.

### Vitamin deficiency anemia

Besides iron, your body needs folate and vitamin B-12 to produce enough healthy red blood cells. A diet lacking in these and other key nutrients can cause decreased red blood cell production. Also, some people who consume enough B-12 aren't able to absorb the vitamin. This can lead to vitamin deficiency anemia, also known as pernicious anemia.

### Anemia of inflammation

Certain diseases — such as cancer, HIV/AIDS, rheumatoid arthritis, kidney disease, Crohn's disease and other acute or chronic inflammatory diseases — can interfere with the production of red blood cells.

### Aplastic anemia

This rare, life-threatening anemia occurs when your body doesn't produce enough red blood cells. Causes of aplastic anemia include infections, certain medicines, autoimmune diseases and exposure to toxic chemicals.

### Anemia associated with bone marrow disease

A variety of diseases, such as leukemia and myelofibrosis, can cause anemia by affecting blood production in your bone marrow. The effects of these types of cancer and cancer-like disorders vary from mild to life-threatening.

### Hemolytic anemia

This group of anemias develops when red blood cells are destroyed faster than bone marrow can replace them. Certain blood diseases increase red blood cell destruction. You can inherit a hemolytic anemia, or you can develop it later in life.

### Sickle cell anemia

This inherited and sometimes serious condition is a hemolytic anemia. It's caused by a defective form of hemoglobin that forces red blood cells to assume an abnormal crescent (sickle) shape. These irregular blood cells die prematurely, resulting in a chronic shortage of red blood cells.

## METHODOLOGY

### STUDY POPULATION

#### Inclusion Criteria

AGE: From 5 to 95

Both male and female patients

Patients with

- ✓ Hypertension
- ✓ Diabetes mellitus
- ✓ Peptic ulcer
- ✓ Urinary tract infection
- ✓ Cellulitis
- ✓ Angina pectoris

### Exclusion Criteria

- ✓ Pediatrics.
- ✓ Geriatrics.
- ✓ Pregnancy and lactating women
- ✓ Organ dysfunction.
- ✓ Critically ill patients.
- ✓ Those who are non-compliant.

### METHODS

The data entry form was specially designed for this study. Data entry form was used to collect the patient's details. Then patient those who were suffering from anaemic disorders and

segregated the based on the disease (Diabetes Mellitus, peptic ulcer, hypertension, urinary tract infection, cellulitis, angina pectoris). For this study data's were collected from the Medical Record Department at Vivekanandha Medical Care Hospital, Tiruchengode. The collected data was compared and charted with percentage. And reported on analysis of prevalence on anemia and Economic study on anemic Disorders.

### RESULT

The present study was an attempt to understand the anemic patients in various clinical condition in private hospital. The total number of patients in the study site during the study period was found to be 99.

### Gender Distribution

An overall gender distribution of the study population was given which indicates equal number of males and female population.

**Table 1: Gender distribution**

Gender	Number of patients	Percentage (%)
Male	51	51.51%
Female	48	48.48%

### Age Distribution

Our study includes the inpatients those who were anaemic under the age between 15 to 95 years, except pediatrics and Age distribution reveals that 11.11% belongs to 5-20 years followed by 5.05% were belongs to 21-35 Years, 20.20% were belongs to 36-50 years, 42.42% were belongs to 51-65 years, 20.20% were belongs to 66-80 years, 1.01% were belongs to 81-95 years. This shows that most of the patients belong to the category of late adulthood age (51-65).

**Table 2: Age distribution**

S.No	Age(Years)	Number of patients	Percentage(%)
1	15-20	11	11.1
2	21-35	5	5.05
3	36-50	20	20.20
4	51-65	42	42.42
5	66-80	20	20.20
6	81-95	1	1.01

### Diagnosis

According to our study prevalence of anemia in eight different type of disease conditions were analysed and tabulated below:

**Table 3: Diagnosis**

S.No	Diagnosis	Number of patients	Percentage (%)
1	Diabetes mellitus	17	17.17
2	Hypertension	16	16.16
3	Urinary tract infection	15	15.15
4	Angina	15	15.15
5	Ulcer	11	11.11
6	Stroke	11	11.11
7	Anemia	9	9.09
8	Edema	5	5.05

## Symptoms

In our study we have found different types of symptoms which include fatigue, weakness, pale or yellowish skin, irregular heartbeat, shortness of breath, dizziness, chestpain, cold hand and feet, headache. The study shows that the highly showed symptom was shortness of breath.

**Table 4: Symptoms**

S.No	Symptoms	Number of patients	Percentage (%)
1	Fatigue	5	5.05
2	Weakness	10	10.10
3	Pale or yellowish skin	11	11.11
4	Irregular heartbeat	9	9.09
5	Shortness of breath	20	20.20
6	Dizziness	15	15.15
7	Chest pain	14	14.14
8	Cold hand and feet	5	5.05
9	Headache	10	10.10

## Drug Distribution

In our study drug usage by the patient for the following drugs were prescribed by the doctor folic acid, ferrous sulphate, ferrous gluconate, leucovorin are the drugs distributed throughout the patients. Among this folic acid has a greater extend than the other drugs in the hospital the highly prescribed drugs are folic acid.

**Table 5: Drug Distribution**

S.No	Drugs	Number of patients	Percentage (%)
1	Folic acid	55	55.55
2	Ferrous sulphate	15	15.15
3	Ferrous gluconate	17	17.17
4	Leucovorin	12	12.12

## Anemia In Various Clinical Conditions

**Table 6: Anemia with cardiovascular disorder**

DISEASE	NO OF PATIENT	PERCENTAGE(%)
Hypertension	16	16.16
Angina	15	15.15

**Table 7: Anemia with Endocrinological disorder**

DISEASE	NO OF PATIENTS	PERCENTAGE(%)
Diabetes mellitus	17	17.17
Thyroid	2	0.02

## Drug Distribution For Various Clinical Condition

**Table 8: Drug for Anemia with stroke**

S.No	DRUG NAME	NO OF PATIENTS	PERCENTAGE(%)
1	Clopidogrel	52	52.52
2	Atorvastatin	20	20.20
3	Pantaprazole	15	15.15
4	Piracetam	12	12.12

**Table 9: Drug for Anameia with Hypertension**

S.No	DRUG NAME	NO OF PATIENTS	PERCENTAGE(%)
1	Pantaprazole	45	45.45
2	Amlodipine	16	16.16
3	Furosemide	25	25.25
4	aspirin	13	13.13

**Table 10: Drug used for Anemia with Diabetes Mellitus**

S.No	DRUG NAME	NO OF PATIENTS	PERCENTAGE(%)
1	Ranitidine	56	56.56
2	Amlodipine	29	29.29
3	Piperacillin	14	14.14

**Table 11: Drug used for Anemia with Hernia**

S.No	DRUG NAME	NO OF PATIENTS	(%)PERCENTAGE
1	Lidocaine	29	29.29
2	Promethazine	14	14.14
3	Inj. Tentanus toxoid	56	56.56

## DISCUSSION

Our study demonstrated three important findings: increasing age was associated with increased prevalence of anemia; females, were at higher risk for having anemia; and the presence of one or more co morbidities (such as essential hypertension , UTI , peptic ulcer, diabetes mellitus and coronary artery disease) was associated with a higher prevalence of anemia compared to the patients without these factors. Furthermore, our results also show that patients with a greater severity of anemia underwent further diagnostic tests to investigate the cause.

According to our study 99 case sheets were collected and categorized as gender, age, diagnosis, symptoms, and drug distribution .Gender distribution shows anemic patients among the male and female. Here the complications of cataract surgery are having the percentage with 51% male and 48% female in this environment as shown in the Table 1. Our results were coincidence with result conducted by Suchdev P in Anemia epidemiology.

Age group distributions between 15 to 95 years of age were observed for this particular study, where the late adult hoods (55-65) are greater in the percentage in patients with anemia are shown in the Table: . Diagnosis of anemia shows more geriatric patients. In this we have discussed about prevalence of anemia in eight different type of disease conditions. They are diabetes mellitus, hypertension, urinary tract infection, angina, ulcer, stroke, anemia, edema as shown in the Table 3. Symptoms were described in the Table 4 in many symptoms like fatigue, weakness, pale or yellowish skin, irregular heartbeat, shortness of breath, dizziness, headache. Among all the symptoms shortness of breath were found more in anemic patients.

Drug distributions among the patients are exposed in the Table 5 the drugs such as folic acid, ferrous sulphate, ferrous gluconate, leucovorin were prescribed. Folic acid was utilized by the patients only having anemia.

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According to the cardiovascular disorder associated anemic patients given in Table 6. Patients with angina and hypertension were analyzed. The patients with hypertension is found to be more when compared to angina patients. According to the study conducted by Gandhi S in co-morbidity investigation in anemia in the year 2017

According to the endocrinological disorder associated anemic patients given in Table 7 seen that patients with diabetes mellitus and thyroid were analysed. The patients with diabetes mellitus is found to be more when compared to thyroid patients.

Drug distributions among the patients are exposed in the Table 8 the drugs such as clopidogrel, atorvastatin, pantaprazole, piracetam was utilized by the patients having anemia with stroke. Drug distributions among the patients are exposed in the Table 9 the drugs such as pantaprazole, amlodipine, furosemide, aspirin were prescribed. pantaprazole was utilized by the patients having anemia with hypertension.

Drug distributions among the patients are exposed in the Table:10 the drugs such ranitidine, amlodipine, piperacillin was utilized by the patients having anemia with diabetes mellitus.

## CONCLUSION

The study presents the prevalence of anemia in patients with various clinical conditions in the private hospital. Prevalence of anemia is more in male patients with hypertension and diabetes mellitus. It increases the risk of fatigue, irregular heartbeat, shortness of breath, yellowish skin, dizziness and some other complications. To improve the health, it is recommended that the primary health care to be strengthened and high priority should be given to aspects such as prevention, early diagnosis and treatment of anemia.

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