

## Anaemia: A Common Disease of Indian Society

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**Abstract:** A pathological condition in which the number of healthy red blood is decreased. We all are know the red blood cell (RBC) carry oxygen to all of the body tissue, so that the red blood cell count indicates the amount of oxygen in blood lower than it should be symptoms of anaemia are caused by decreased oxygen deliver to the body's vital tissue and organs. A protein in RBC the carry oxygen from lungs to the whole bodies tissue called Haemoglobin. Anaemia show according to the amount of haemoglobin people with ironic diseases have more compatible for anaemia. Iron, vitamin-B<sub>12</sub> and folate are essential for RBC production. The hormone Erythropoietin and Hormone Hypothyroidism also interfergo with the production of RBC whereas condition like endometriosis, gastrointestinal, menstruation excessive uterine bleeding, child birth, cirosis, fibrosis, spleened liver disorder, accident etc. are caused by red blood cell destruction.

**Key Words:** Anaemia, RBC, blood loss, antiglobulin test.

### 1. INTRODUCTION:

30% of the total population are anaemic and half of the 600 million people are suffer from only iron deficiency anaemia in world. Haemoglobin is main component in our body in RBC which carry oxygen in whole body through blood deliver oxygen to cell. When the RBC is decrease in our blood then we suffer from anaemia. 14gm/dl in male and 12.5gm/dl in female is the normal value of haemoglobin. When the ratio is lower to the value of haemoglobin is called anaemia. Generally, people over age of 65 years are at increase risk of anaemia. Classification depends upon the size of red cells and indicate the likely cause. The marrow compartment red cell precursors undergo cell division driven by erythropoietin. A defect of cell division is seen in the presence of cytotoxic drug or haematological disease in the marrow such as myelodysplasia. The membrane of red cell is composed of lipid bilayer and contain lipid which is freely exchange with the plasma pool of lipid. Raised lipid may cause a raised MCV in liver disease, hypothyroidism and pregnancy also.

### 2. TYPES OF ANAEMIA:

#### 1. Iron deficiency Anaemia

This will occur when iron losses or, physiological requirements exceed absorption. Absorption of iron is decrease in pH. Healthy body store iron 3 to 6gm/day in male and 2 to 4gm/day in female. Iron is breakdown from dead taken by microphages.

It is most common type of Anaemia. Iron deficiency Anaemia is usually caused by **blood loss**.

The most common explanation in man and menopausal woman is gastrointestinal blood loss. On a world-wide basis hook worm and schistosomiasis are prevalent caused of gut blood loss. Hook worm suck 0.5 to 1.5ml of blood daily. Parasite infection like hook worm or, round worm cause iron deficiency anaemia is most common in rural area of India. Also cause poor intake of iron in daily diet. In woman of childbearing age menstrual blood loss, pregnancy and breast feeding contribute to iron deficiency by depleting iron stores.

#### ➤ Malabsorption

Gastric acid is required to release iron from food and helps to keep iron in the soluble ferrous state. Iron is absorbed activity in the upper small intestine and hence can be affected by coeliac disease. A dietary assessment should be made in all person to assess their iron intake.

#### ➤ Physiological demands

At the time of rapid growth such as infancy and puberty iron demands increase. In pregnancy iron is diverted to the fetus, the placenta and the increased maternal red cell mass and is lost with bleeding at parturition.

Serum iron level cause and iron binding capacity is increased initially anaemia then later on persistent deficiency due to increased anisocytosis RBC because necrocity hypochromicity.

#### ➤ Confirmation of iron deficiency

Plasma ferritin is a measure of iron stores. It is a very specific test, a subnormal level is due to iron deficiency, like hypothyroidism or, vitamin C deficiency. In difficult cases sometimes necessary to examine a bone marrow aspirate for iron stores.

Investigation depends upon the age and sex of the person as well as the history and clinical sign. Stool and urine should be examined for parasites.

Ferrous sulphate 120mg of elemental iron per day continued for 3-6 months.

## 2. Vitamin Deficiency Anaemia

Or

### Megaloblastic Anaemia

Megaloblastic anaemia means a deficiency of vitamin B<sub>12</sub> or, folic acid or, from disturbances in folic acid metabolism. Folate is an important substrate of vitamin B<sub>12</sub>. A cofactor for the enzymatic generation of the essential amino acid methionine from homocysteine. Iron stores are raised. The mature neutrophil shows hyper segmentation of their nuclei.

#### ➤ **Vitamin B<sub>12</sub> Absorption**

Daily diet contains 5-30µg of vitamin B<sub>12</sub> from meat, eggs and milk. The daily requirements for vitamin B<sub>12</sub> of 1µg. vitamin B<sub>12</sub> deficiency takes years to become manifest even if all dietary intake is stopped.

#### ➤ **Dietary Deficiency**

At any age between 10 and 80 years of age.

#### ➤ **Pernicious Anaemia**

It is an autoimmune disorder in which the gastric mucosa is atrophic with loss of parietal cell causing intrinsic factor deficiency. This is more common in individual with a personal or, family history of pernicious anaemia or, autoimmune disease.

#### ➤ **Folate Deficiency**

Plant and bacteria produce folate hence dietary leafy vegetables, fruits and animal protein are rich source of folate. Daily intake of 50µg of folate. Excess cooking for longer than 15 minutes destroys folate. During pregnancy folate deficiency is the most common cause of megaloblastosis. Intake a single meal extra can normalise in true folate deficiency. In some countries all pregnant women receive routine folic acid supplementation.

## 3. **APLASTIC ANAEMIA:**

### • **Primary Idiopathic Acquired Aplastic Anaemia**

In developed countries this disorder is rare. Yearly 3-6 new cases per million in population. Failure of the pluripotent stem cells is main problem producing hypoplasia of the marrow elements. An autoimmune mechanism is responsible in pregnancy. It should be exposure of drugs, chemicals and radiation or, viral illness like hepatitis are important.

### • **Secondary Aplasia**

It is important to investigate the report side effects of the drugs which taken over the months. The cytopenia is more selective and offers only one cell line, most often the neutrophils, it is immune basis but this is difficult to prove. The bone marrow should be examined by aspiration and trephine.

Aplastic anaemic person are required blood product to support and aggressive management of infection. Bone marrow transplantation if there is an available donor successful pre-transplant conditioning can achieved with cyclophosphamide alone. 60% survival has been reported after bone transplantation in young patient and similar results can be achieved with immunosuppressive regimens involving anti thrombocyte globulin.

## 4. **Haemolytic Anaemia**

Or

### **Acquired Haemolytic Anaemia**

#### • **Auto Haemolytic Anaemia:**

When increased red cell destruction due to red cell auto antibodies. The optimum temperature at which the antibody is active (thermal specificity) is used to classify immune haemolysis.

#### • **Warm Autoimmune Haemolysis:**

Warm antibodies bind best at 37°C. usually IgG react against rhesus antigens. No caused in identified in 50% of cases. Remainder are secondary to many variety of other condition like leukaemia, solid tumour, connective tissue disease also some specific drug and HIV. It is confirmed by the direct coombs or, antiglobulin test. The most common specificity is rhesus and most often anti-e it helpful when choosing blood to cross-match. The standard coombs reagent will IgA or, IgE antibodies.

#### • **Cold Agglutinin disease:**

Cold antibodies bind best at 4°C but can bind up to 37°C in some cases. They are usually IgM which bind to the red cells at 4°C and cause them to agglutinate. This may cause intravascular haemolysis if complement fixation occurs. This can be chronic when the antibodies is monoclonal and acute or transient when the antibody is polyclonal.

Chronic cold agglutinin disease- this affects elderly person and may be associated with an underlying low grade B-cell lymphoma. So, person must keep extremities warm especially in winter.

- **Non-Immune Haemolytic Anaemia**

Physical disruption of red cell may occur in same condition is characterised by presence of red cell fragments on the blood film and markers of haemolysis. Like

- Mechanical heart valves
- March haemoglobinuria
- Thermal injury
- Microangiopathic haemolytic anaemia

Infection like *Falciparum malaria* cause Blackwater fever due to haemoglobinuria and *Clostridium perfringens* septicaemia cause ascending cholangitis due to spherocytosis are due to bacterial production of a lecithinase which destroys the red cell's membrane.

Chemicals or drugs also cause haemolysis by oxidant denaturation of haemoglobin. Arsenic gas, copper, chlorates, nitrites and nitrobenzene derivatives may all cause haemolysis.

## 5. SICKLE CELL ANAEMIA:

Sickle-cell disease results from a single glutamic acid to valine substitution at position 6 of the beta globin polypeptide chain. It is inherited as an autosomal recessive trait. Homozygotes only produce abnormal beta chain that make haemoglobin S (HbS termed SS) and this results in the syndrome of sickle cell disease.

Low O<sub>2</sub> tension to soluble leading to polymerization produce insoluble crystal responsible of destruction.

If pH is acidic or, more than sickle. If MCHC is low, then increase. Sickling viscosity of blood is decrease and increase the rigidity of RBC produces vascular occlusion.

Viral infection leading to folate deficiency followed by bone marrow.

Hyper haemolytic crisis in sickle cell develop from G<sub>6</sub>PD deficiency co-exist with sickle cell anaemia.

### Sign And Symptom:

When decrease the number of healthy red blood cells in our body anaemia is caused. Like less number of haemoglobin and decrease oxygen carrying capacity. Body is fatigue weakness, pale or yellowish skin, irregular heartbeat, chest pain, cold hand & feet, headaches is appear in body. Heavy menstrual flow of blood during period in female. Apart from this some are the risk factor of anaemia.

- Lack of certain vitamins and minerals in diet.
- Intestinal disorders.
- Menstruation.
- Pregnancy.
- Chronic condition.
- Family history.
- Other factors.
- Breast feeding.
- Avoid certain drugs & caffeinated drinks.
- Donated blood often.
- Endurance training.

## 6. PREVENTION FROM ANAEMIA :

Anaemia is classified in many type but can't be precursors, but we can need safe from the iron deficiency anaemia by taking some healthy food. Example green and leafy vegetables, red meat, lentils, beans and iron fortified cereal, breads and fruits. Eat & drink vitamin-C rich food & drink. Avoid drinking tea and coffee with meal because they can affect iron absorption. By getting sufficient amount of minerals and vitamins such as iron, folate, vitamin-B<sub>12</sub>, vitamin-C are including the avoid of anaemia.

An anaemia people has insufficient amount of RBC of a vital blood protein called Hg<sub>4</sub> that means body do not carrying capacity to oxygen so take an iron rich protein like egg yolk, orange, grapes, fruit, papaya, spinach, broccoli & dark green leafy vegetable.

- Make a healthy food choice.
- Intake of Vitamin-C rich food to increase the iron absorption capacity.
- Megaloblastic is single type of faulty red cell productions.

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