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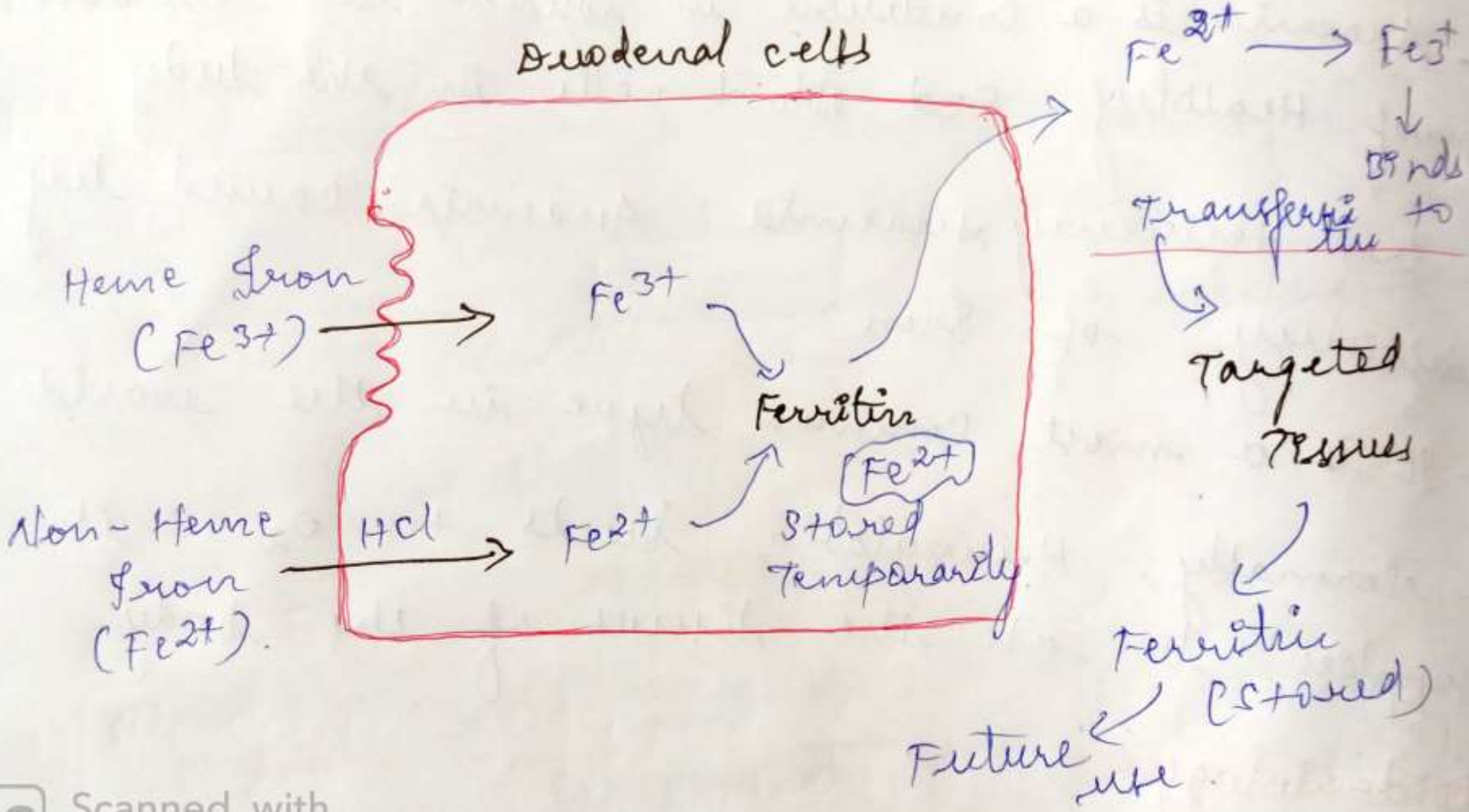
INTRODUCTION

- Anemia is a condition in which the decreased number of healthy red blood cells is seen in the body.
- Iron deficiency anemia: anemia caused by deficiency of iron.
- It is a most common type of anemia in the world
- Also known as Microcytic hypochromic anemia.

EPIDEMIOLOGY

- Iron deficiency anemia affected about 1.48 billion people in 2015.
- Women and young children are commonly affected.
- 54,000 deaths are seen in 2015 due to iron deficiency anemia.



ETIOLOGY

There are 4 main causes of IDA:

- Decreased intake
- Decreased absorption
- Increased demand
- Increased loss

Decreased intake

- It is the most common cause of IDA in worldwide.
- Mainly in infants due to:
- Decreased iron in breast milk
- And commonly seen in vegetarians.

Decreased absorption

- It is due to decreased acid production in case of gastrectomy.
- In also with inflammatory bowel disease and celiac disease.
- This both is due to inflammation and destruction of duodenal cells.

Increased demand

- Increased demand occur in children and adolescents: due to rapid growth and increased blood volume.
- Also in case of pregnancy: because of increased iron requirement in fetal development.

Increased loss

- Increased loss is due to Chronic slow bleeding.
- In females: because of frequent or heavy menstrual bleeding.
- Bleeding gastric ulcer.
- In elderly: colon cancer cause bleeding leads to IDA.
- H.pylori infection leads to gastric ulcer and gastrointestinal bleeding.
- Hookworms: In intestines, hookworms sucks the blood which leads to loss of blood.

PATHOPHYSIOLOGY

Anemia

Anemia can be developed by any of the three factors:

- Blood loss
- Increased RBC destruction
- Decreased RBC production

Blood loss

- It is a most common cause of IDA; which includes
- Heavy Menstrual bleeding in women.
- Gastrointestinal bleeding
- Gastrointestinal bleeding is due to :
- Peptic ulcer disease
- NSAIDS
- Inflammatory bowel disease.

Increased RBC production

- It may be caused by RBC malformations which includes: sickle cell anemia, Thalassemia which is congenital.
- Acquired: Autoimmune Disease
- Microangiopathy:A disease of the capillaries (very small blood vessels), in which the capillary walls become so thick and weak that they bleed, leak protein, and slow the flow of blood
- Thrombotic thrombocytopenic purpura (TTP): is a blood disorder in which platelet clumps form in small blood vessels. This leads to a low platelet count (thrombocytopenia).

Decreased RBC production

Decreased RBC production may be developed due to:

- Aplastic anemia
- Vitamin deficiency (Vitamin B12 and folate)
- Anemia of inflammation

Aplastic anemia

A rare condition in which the body stops producing enough new blood cells.

- Aplastic anemia occurs due to:
- Bone marrow dysfunction: which occurs due to chemicals, radiation, chemotherapy.
- This bone marrow dysfunction leads to bone marrow suppression.

Vitamin deficiency

This may occur due to either Vitamin B12 or folate deficiency.

Folate deficiency:

- This may be due to malnourishment and alcohol abuse.
- Alcohol may disrupt metabolism and storage of folate in liver.
- Folate deficiency is a potential cause of anemia.
- Normally, folic acid is necessary in production of nucleic acids (guanine and alanine) which is necessary for DNA synthesis in RBC cells.
- Here, decreased amount of folic acid leads to decreased RBC production.

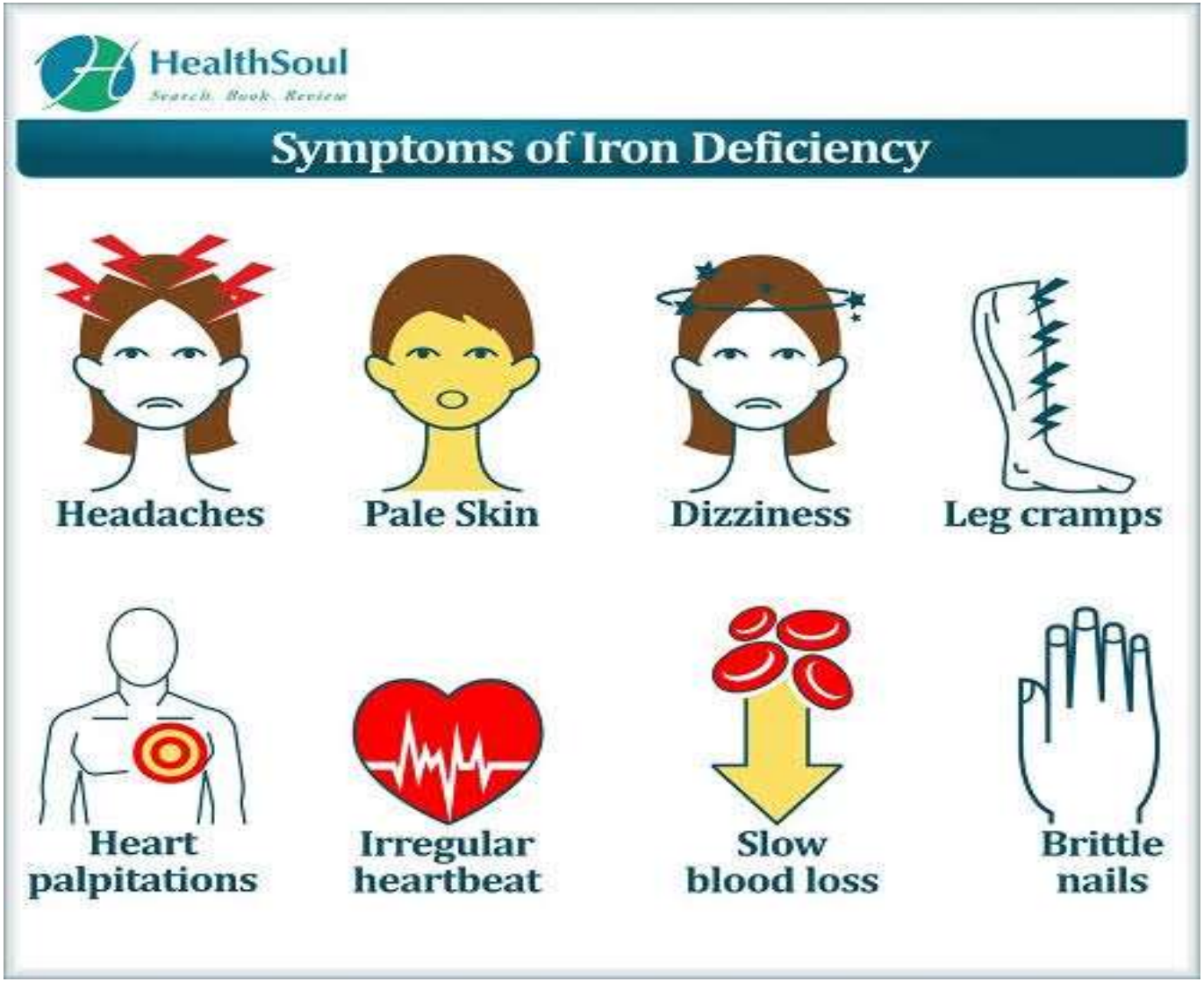
Vitamin B12 deficiency:

- Normally, vitamin B12 absorption takes with the help of intrinsic factors such as acid and enzymes which is released by parietal cells.
- Decreased intrinsic factor is due to autoimmune disease, congenital Disease, chronic gastritis, gastrectomy.
- This decreased intrinsic factor decreases the absorption of vitamin B12.
- Vitamin B12 release co- enzyme which is necessary for DNA synthesis for the development of normal RBC production.
- So, this vitamin B12 deficiency leads to decreased RBC production.

Anemia of inflammation

- Inflammation may be infection, malignancy, autoimmune disease, burns or trauma.
- This inflammation is mediated by cytokines such as IL-1, IL-6, TNF, INF.
- Cytokines release may produce three various stages such as:
- Bone marrow suppression: bone marrow suppression leads to decreased RBC production
- Autolysis of RBC: breaking or lysis of RBC by cytokines.
- Decreased availability of RBC: cytokines decrease ferritin storage in spleen which decrease availability of RBC.

SYMPTOMS


HealthSoul
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Symptoms of Iron Deficiency
Headaches
Pale Skin
Dizziness
Leg cramps
Heart palpitations
Irregular heartbeat
Slow blood loss
Brittle nails

DIAGNOSIS

Determination of Parameters in blood

Haemoglobin: decreased Haemoglobin level

MCV: decreased MCV due to decreased RBC

Red blood cell distribution width (RDW):

RBC seen in different sizes.

TREATMENT

Oral iron supplements

- Ferrous sulphate
- Ferrous gluconate
- Ferrous fumerate

Intravenous iron supplements

In severe cases

- Blood transfusion


Thank You