



Pale Palpebral Conjunctiva



NUTRITIONAL ANEMIA

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NUTRITIONAL ANEMIA

DEFINITION

- ❑ It is a disease syndrome caused by Malnutrition.

Acc to WHO –

A condition in which haemoglobin content of blood is lower than normal, as a result of deficiency of one or more essential nutrient, specially iron.



NUTRITIONAL ANEMIA

Deficiency of

A. Iron

B. Folate

C. B¹²

D. Protein

corrected by supplementation

NUTRITIONAL ANEMIA

Examples: Iron deficiency anemia and pernicious anemia.

A. Micro-: Iron deficiency anemia

A. Plummer-Vinson syndrome

B. Macro-: Megaloblastic anemia

A. Pernicious anemia

ANEMIA

ANEMIA - Insufficient Hb to carry out O₂ requirement by tissues.

WHO definition : Hb conc. < 11 gm %

CDC definition : Hb conc. < 11gm % in 1st and 3rd trimesters and < 10.5 gm% in 2nd trimester

For developing countries : cut off level suggested is 10 gm %

- *WHO technical report Series no. 405, Geneva 1968*

Centre for disease control, MMWR 1989;38:400-4

WHO CUT OFF CRITERIA OF HB% (IN VENOUS BLOOD)

Adult man	13 gm/dl
Adult woman (non pregnant)	12 gm/dl
Adult woman (pregnant)	11 gm/dl
Child above 6 yrs	12 gm/dl
Child below 6 yrs	11 gm/dl

A) IRON DEFECIENCY ANEMIA

INTRODUCCIÓN

- ❖ Iron deficiency (ID) is one of the most frequent nutrition deficiency all round the world. (In India - 50%)
- ❖ Its prevalence is higher in children and childbearing age women.
- ❖ Iron deficiency anemia (IDA) mainly affects child behavior and development, work performance and immunity.

PROBLEM STATEMENT

WORLD

It is a world wide problem with highest prevalence in developing countries.

It affect nearly $\frac{2}{3}$ of pregnant and $\frac{1}{2}$ of non pregnant.

INDIA-

Overall , 72.7 % of children up to age of 3 year in urban and 81.2% in rural are anaemic .

It was found that , except for Punjab , all other state had more than 50% prevalence of anaemia among pregnant women.

% OF IDA IN INDIA IN VULNERABLE GROUPS

Vulnerable groups	% of Population with Anemia
Adult male	20
children	40
Adolescent girls	56
Adult female	60
Pregnant mothers	80

MAGNITUDE OF IDA

PREVALANCE %	PUBLIC HEALTH PROBLEMS
Less than 5 %	Not a problem
5-19.9	Low magnitude (Mild)
20-39.9	Moderate magnitude (Moderate)
40 and above	High magnitude (Severe)

SOURCES OF IRON

Animal- meat, liver, kidney, egg yolk.

Veg.- pulses, beans, peas, green vegetables and fruits

Milk- Human milk -0.29- 0.45mg/dl

(Cow's milk –poor source with 0.01 – 0.38mg/dl)

CAUSES OF IDA

1. Diminished stores
2. Diminished intake: d/t cereals & pulse based diet
3. Diminished absorption
4. Increased demands: During pregnancy & infections
5. Defective metabolism
6. Infections: Ankylostomiasis, PU, Ulcerative colitis, hemorrhoids

DETRIMENTAL EFFECTS OF IDA

1. **Pregnancy:** Increases risk of maternal & fetal morbidity & mortality (INDIA: 19% maternal deaths).
2. **Infection:** Anemia can be caused by infections (malaria, intestinal parasites) and may increase susceptibility to infections.
3. **Decreased work capacity.**
4. **Growth failure among children**

HIGH RISK FACTORS

Demographic factors

- Elderly
- Teenager
- Female
- Immigrant
- Aborigine
- Widower

Dietary factors

- Low iron, haem iron
- Low Vitamin C
- Excess phytate
- Excess tea/coffee
- Fad diets

High Risk

Very High Risk

High Risk

High Risk

- Poverty
- Poor detention
- Alcohol abuse
- Candle burning
- GIT disease
- Depression

Social/physical factors

SYMPTOMS OF ANEMIA

Symptoms of Anemia

Red = In severe anemia

Eyes
- Yellowing

Skin
- Paleness
- Coldness
- Yellowing

Respiratory
- Shortness of breath

Muscular
- Weakness

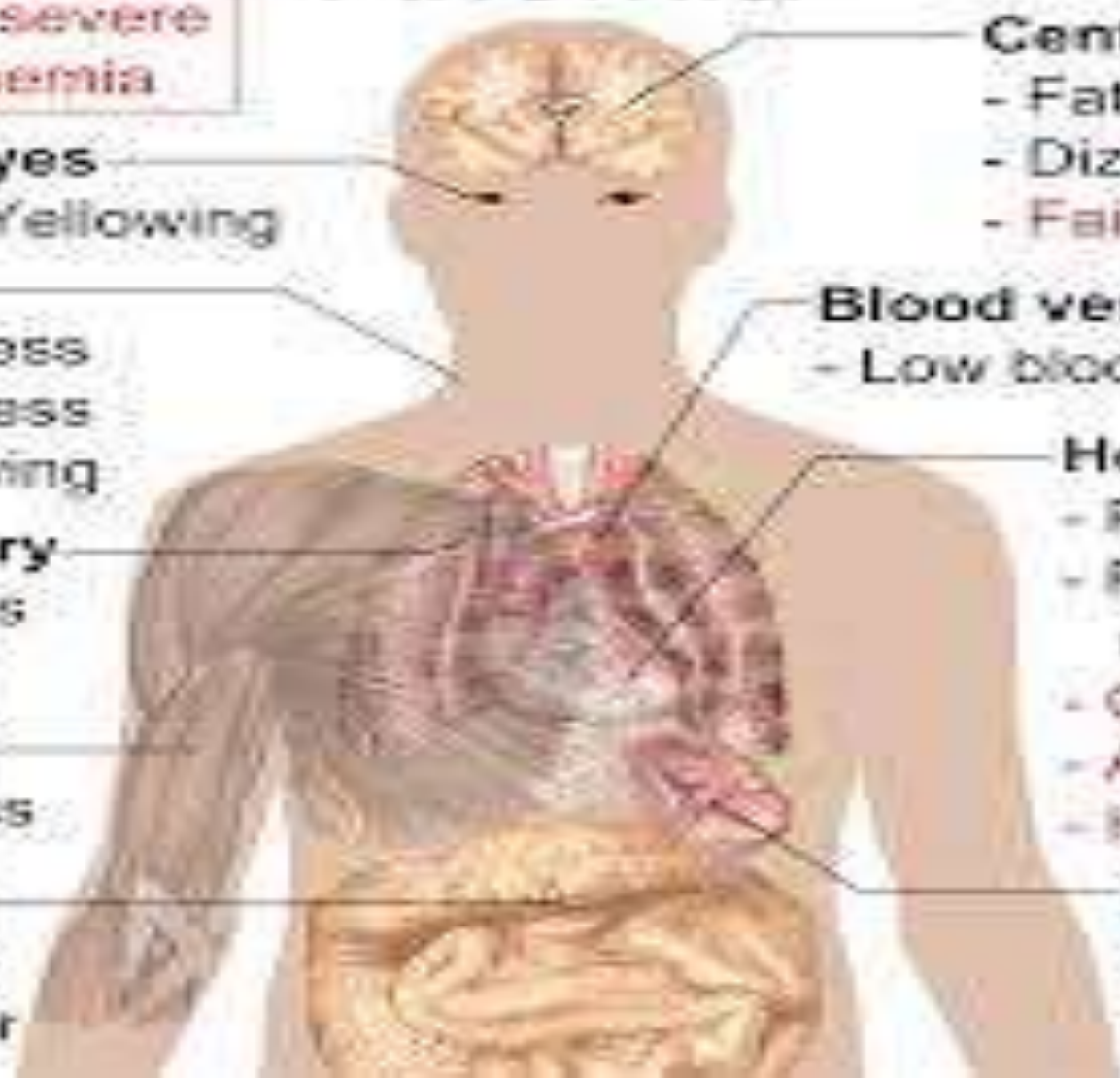
Intestinal
- Changed stool color

Central
- Fatigue
- Dizziness
- Fainting

Blood vessels
- Low blood pressure

Heart
- Palpitations
- Rapid heart rate
- Chest pain
- Angina
- Heart attack

Spleen
- Enlargement



Symptoms

Irritability

Lack of Concentration



Fatigue

Infection



Palpitation

Weakness

Dizziness



SIGNS

**Soft ejection
systolic
murmur**

**Pallor of skin
And m/m**

Edema

Signs

**Tachycard
ia**

**Platynychia
Koilonychia**

**Glossitis
Stomatitis**

ASSESSMENT OF IDA

- I. Clinical and
- II. Laboratory indices.

Laboratory indices are the most common methods used to assess iron nutrition status.

I. CLINICAL INDICES

Pallor of the:
Conjunctiva,
Tongue,
Nail bed and palms



II. LABORATORY INDICES

1. Low Hemoglobin
2. Low Hematocrit
3. Low Mean Corpuscular Volume
4. Serum Ferritin $<10\text{ng/ml}$
5. Transferrin Saturation $<15\%$
6. TIBC $>350\mu\text{g/dl}$
7. Increased free erythrocyte protoporphyrin

PREVENTION OF NUTRITIONAL ANEMIA

I. HEALTH PROMOTION

1. Adequate nutrition
2. Nutrition education to improve dietary habit
3. Breast feeding and appropriate weaning diet
4. Iron rich food
5. Increase ascorbic acid
6. Health education
7. Periodical deworming specially among children and at least once during IIInd trimester of pregnancy
8. Nutritional supplementation
9. *Foot wear use*
10. *Safe drinking water*

II. SPECIFIC PROTECTION

1. Food fortification
2. National nutritional anemia prophylaxis program (NNAPP)
3. National nutritional anemia control program (NNACP):
The elemental iron was increased from 60 mg to 100 mg per tablet in 1992

NEW RECOMENDATIONS

1. Infants b/w 5-12 months should also be included as beneficiaries for iron supplementation, under ICDS Scheme.
2. Liquid formulations to be prepared, each ml containing 20 mg of iron & 100 mcg of folic acid
3. For children b/w 6-10 yrs, 30 mg of iron and 250 mcg of folic acid.
4. For children b/w 10-18 yrs (adult dose) also to be included as beneficiaries for iron supplementation.

BENEFICIARIES & BENEFITS

BENEFICIARIES:

- A. Pregnant mothers
- B. Lactating mothers &
- C. Children b/w 1-12 yrs

BENEFITS: Iron & folic acid (IFA) tabs are distributed free of cost.

DOSES

- Iron & Folic Acid (IFA) supplementation: National Nutritional Anemia Prophylaxis Programme (NNAPP):

- **Eligibility criteria:** Hb level 10-12 receives IFA tablets; <10 referred to PHC (MO).
- **Dosage:**
 1. **Mothers:** One IFA tablet (100 mg elemental iron + 500 µgm folic acid) X 2-3 months after Hb level returned to normal.
 2. **Children:** Screening for anemia at 6 mths, 1 yr & 2 yrs of age.
 3. **Children upto 6 yrs:** One IFA tablet (20 mg elemental iron + 100 µgm folic acid) X 100 days.
 4. **Children 6-10 yrs:** One IFA tablet (30 mg elemental iron + 250 µgm folic acid) X 100 days.

GRADING & T/T OF ANEMIA

GRADE (WHO)	DEGREE OF ANMIA	TREATMENT
11-14 gm/dl	Normal	Nothing required
9-11 gm	Mild	Oral iron therapy required
7-9 gm	Moderate	Parenteral iron therapy
Less than 7 gm	Severe	Blood transfusion

TREATMENT OF IDA

1. Treat underlying cause (hook worm etc)
2. Oral iron therapy: 3-6mg/kg in 3 divided doses (Hb rises by 0.4g/day)
3. Vit C, empty stomach or in between meals: For 6-8 wks after Hb is normal
4. Parental iron therapy (Iron in mg=wt in kg× Hb deficit in gm/dl×4)
5. Blood transfusion –rarely when Hb<4gm/dl, CCF, severe infection with poor iron utilisation

B) FOLIC ACID DEF

1. Necessary for DNA synthesis.
2. **SOURCES:** Liver, soya bean, dark green leafy vegetables
3. **CAUSES:** Strict vegetarian, Tape worm anemia, Repeated Pregnancy, Chronic diarrhea, malabsorption and recurrent infections
4. Cooking destroys folic acid
5. **Deficiency disease:** Megaloblastic anemia in children & pregnant mothers
6. **Treatment** with phenytoin / antimetabolites
7. T/T: Folic acid 2-5 mg/day
8. RDA: 500 mcg/day for pregnant mother

C) B¹² DEFICIENCY

Necessary for DNA synthesis.

SOURCES: Foods of animal origin only (fish, egg, meat)

DISEASES: Megaloblastic anemia, parasthesia of fingers & toes.

It is observed in breast fed infants of vit. B¹² deficient mother & delayed weaning child

RDA: Vit. B¹² 1μg/day

CLINICAL FEATURES

1. Pale
2. Very sick
3. Irritable
4. Severe anorexia
5. Failure to thrive
6. Knuckle pigmentation (hands and nose)
7. Tremor and developmental regression





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Thank You