.... & you thought Anaemia is just Paleness!

Wake up and join me to know the minimum a Primary Care Physician (that is us!) has to know about Anaemia! Anaemia refers to a condition wherein there is a reduction in the circulating red cell mass. As a result both the hemoglobin concentration and hematocrit (Packed Cell Volume) are reduced.

CLASSIFICATION: CAUSATIVE

1. Anaemia from blood loss
   a. Acute – bleed from an gastric/ duodenal ulcer
   b. Chronic – hookworm infestation, Menorrhagia, piles etc
2. Excessive RBC destruction or diminished synthesis of Hb
   a. Infections – malaria, bacterial infections
   b. Effects of chemicals, drugs, radiation
   c. Miscellanous – cirrhosis of liver, splenic vein thrombosis, chronic renal failure, malignancies
3. Deficiency Anaemia
   a. Iron
   b. B_{12}, Folate
   c. Protein
   d. Misc – copper, Vit C & Vit E
4. Bone marrow failure
   a. Aplastic anaemia
   b. Infections
   c. Malignancy
   d. Collagen disorders etc

CLASSIFICATION: MORPHOLOGICAL

In addition to Haemoglobin, there are 3 constants of red corpuscle

1. MCV (Mean Corpuscular Volume) → PCV X 10/ RBC in millions
2. MCH (Mean Corpuscular Hemoglobin) → Hb in gm X 10 / RBC in million per cc
3. MCHC (Mean Corpuscular Hemoglobin Concentration) → Hb in gm X 100/ PCV %

On the basis of cell size		On the basis of Hb concentration / cell	
Microcytic	*Smaller than normal*	Normochromic	*Normal*
Macrocytic	*Larger than normal*	Hypochromic	*Lower concentration*
Normocytic	*Normal size*		

These parameters change with age. The values of different parameters at different ages are given in table at end.

CLINICAL FEATURES (GENERAL)

Symptoms of Anaemia depend on the rate at which Anaemia develops, severity of Anaemia and change in the blood volume. Features of Anaemia are mostly due to "oxygen lack". Resulting adjustment leads to increased rate of blood flow and transfer of blood to more vital areas. The cardiac output increases proportionately to degree of Anaemia. Pulse rate and volume are increased. Viscosity of blood, peripheral resistance and diastolic blood pressure are decreased. These physiological adjustments occur when Hb falls below 7 Gm%. While these symptoms are common to all Anaemias, symptoms due to cause will vary. Clinical symptoms get more pronounced when Cardio Vascular System is affected.

In majority of cases in our practice, the development of Anaemia is so gradual that the body adapts itself to the lowered oxygen supply that the patient hardly complains of any symptoms until the Hb levels have fallen

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very low.

The general symptoms common to all Anaemias are

- weakness
- easy fatigability
- loss of weight & appetite
- vague gastro intestinal symptoms
- frequent respiratory and/or skin infections

PHYSICAL SIGNS:

Pallor of skin, nails and mucous membranes usually indicates low levels of Hb. Best observed in mucous membranes, nail beds and creases of the palm. Long standing cases of Iron deficiency anaemia may have Platonychia (flattened nails) or Koilonychia (spoon shaped nails). Oedema of feet is frequently seen. Glossitis, stomatitis, smoothening of tongue may also be seen. As a result of oxygen lack, dyspnoea on exertion, tachypnoea and palpitations may be present. Very late, symptoms of cardiac failure may also appear (Hb less than 5 Gm%). Females may get amenorrhoea. Children may present with arrest of growth and delayed wound healing.

DIAGNOSIS:

Pallor is NOT synonymous with Anaemia. Diagnosis of Anaemia, its cause and severity must be established by blood tests. Adequate thought is to be given to blood loss (hook worm, menorrhagia) while taking history as also to the adequacy of diet. Unexplained anaemia in children should bring up the suspicion of Thalassemia (discussed separately).

As a first step, ask for – Complete Blood Count with Indices – insist on a cell counter reporting against manual wherever possible. Study of a peripheral smear for morphology of RBCs and demonstration of parasites is a must. WBC count may indicate infections or malignancy. Simultaneous reduction in Platelet count may signal bone marrow involvement. Stool test for occult blood and a Gynec examination in females, where required, to rule out uterine pathology may be indicated. If Anaemia is not responding to treatment, one may have to go in for Serum Iron, Serum Transferrin and Total Iron Binding Capacity.

READY RECKONER:

1. Normally Packed Cell Volume is 3 times the Hb level. (Hb: 11.8 Gm% will have PCV of 35.4)In acute blood loss Haematocrit will be less than 3 times Hb as it takes time for Hb levels to fall but Packed Cell Volume is affected immediately. If Packed Cell Volume is more than 3 times the Hb, suspect megaloblastic anaemia as with larger RBCs, the PCV is higher.
2. Microcytosis – indicates Iron deficiency anaemia. If the size too small as compared to Hb levels, suspect Thalassemia.
3. Macrocytosis – suspect B_{12} or folate deficiency. Serum B_{12} and Serum Folic acid levels are helpful
4. Poikilocytosis and Anisocytosis means that bone marrow is throwing out immature cells.
5. In hemolytic anaemia (commonest being in Malaria) the serum will be Icteric and more of indirect bilirubin than direct bilirubin confirms the diagnosis.

TREATMENT: GENERAL PRINCIPLES

Rational treatment depends on accurate diagnosis of the cause. Administration of oral Iron by Allopaths and *Fer-phos* by Homoeopaths, empirically, has no place in treatment.

Deficiency anaemias need supplementation of the deficient factor and Hemolytic anaemias need careful recognition of the cause and therapy thereof.

A good physician pre-empts the need of increased iron and supplements it eg in pregnancy, lactation and in a case of malaria.

FOLLOW-UP: Hb levels should not be measured earlier than 2 mths unless clinical indicated by deteriorating clinical condition. Expected rise in Hb level is 1 Gm% in a month.

QUIZ

A female patient comes to your clinic and you have to clinically assess her for Anaemia. Difficulty is that she has *mehndi* on her hands; dark red color on her nails, *kajal* smeared in her eyes and her gums, tongue and cheeks are stained with years and years of chewing pan and tobacco.

How will you ascertain her paleness?

Answer on page: 280 (be honest to yourself)

NORMAL RANGES OF COMPLETE BLOOD COUNT IN CHILDREN

Invest	New Born	2-15 days	>15 days-6 mnths	>6 mnths-2 yr	> 2yr-6 yr	6 yr-10yr
WBC/cu.mm	9.0-35	5.0 – 20.0	6.0 – 20.0	6.0-17.0	5.0-15.0	4.5-13.5
RBC-Mil/cumm	4.5-5.85	4.5 – 5.85	4.0-5.1	4.0-5.1	4.0-5.1	4.5-5.5
Haem-gm%	17-22	15-19	11-15	11-12	11-13	11-13
H C T	55-68	50-60	35-45	33-40	33-40	33-42
M C V – CuU	120+/- 9	112+/-19	111+/-8.2	75-90	75-90	75-90
M C H-UUg	33-37	24-33	24-33	25-32	25-32	25-32
M C H C-%	30-33	30-35	30-35	30-35	30-35	30-35
Differential Count						
Neutro-%	40-80	40-68	30-40	30-40	35-50	40-60
EOSI-%	0-6	0-6	0-6	0-6	0-6	0-6
BASO-%	0-1	0-1	0-1	0-1	0-1	0-1
LYMPHO-%	25-35	25-50	50-60	50-60	40-50	30-45
MONO-%	0-10	0-10	0-10	0-10	0-10	0-10
RETIC-%	2.0-6.0%	0.2-2.0%	0.2-2.0%	0.2-2.0%	0.2-2.0%	0.2-2.0%
ESR-WEST	1 - 12	1 – 12	1 – 12	1 – 12	1 – 12	1 – 12

Reference: 1. Pediatric Hematology PCNA Vol 43 No 3 June 96
Interpretation of CBC By Mark Walters, MD & Herbert Abelson, MD
2. Dacie & Lewis – Practical Haematology
3. Jacques Wallach- Synposis of Lab Medicine

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