

TERM DEFINITION

Anemia* caused by depletion of body iron stores

*ANEMIA DEFINED AS



CAUSES

MOST COMMON

Increased loss of iron

- Menstrual blood loss in premenopausal women
- Gastrointestinal blood loss in men & postmenopausal women

LESS COMMON

- Inadequate iron intake
- Inadequate iron absorption
- Increased iron requirements
 - Growth
 - Pregnancy

CLINICAL PEARLS









people affected worldwide

MOST COMMON

in young children & premenopausal women

50% OF CASES

of anemia in women are caused by iron deficiency









PRESENTATION

SYMPTOMS

ANEMIA

- Fatigue
- Shortness of breath
- Headache
- Palpitations
- IRON DEFICIENCY
 - Restless legs
 - Pica*
 - Hair loss
 - Chinning of na
 - Chipping of nails
 - Sore tongue

SIGNS

IRON DEFICIENCY

- Glossitis
- Cheilitis
- Brittle nails
- Koilonychia

LABS

Typical CBC from patient with iron deifiency anemia:

MRC	RRC	Hgb	Hct	MCV	мсн	мснс	RDW	RDWSD	Plt Ct	
7.5	4.96	10.5*	37.3*	75*	21.2*	28.2*	22.5*	58.0*	455*	

HEMATOLOGY LABS

- Microcytic hypochromic anemia
- Thrombocytosis in some
- Lymphopenia in some
- Low reticulocyte count
- Cigar-shaped red cells on peripheral smear

IRON INDICES

ANEMIA

• Pallor

Tachycardia

- Low serum iron
- High TIBC (surrogate for transferrin level)
- High soluble transferrin receptor
- Low ferritin (marker of iron stores)

***Pica** is defined as the craving for non-nutritive substances



*Usually but not always microcytic, hypochromic



There are many causes of microcytic anemia, but the 2 most common causes other than iron deficiency are thalassemia-minor and anemia of inflammation.



Only if severe, symptomatic anemia

Replenish iron stores:

- Oral iron
- IV iron

**< 20 ng/mL in absence of inflammation; < 50-100 ng/mL in presence of inflammation

IRON DEFICIENCY ANEMIA

can be found in domestic and wild animals, but it is rare compared to humans, partly because females of nonprimate species do not menstruate. It is often caused by inadequate dietary iron intake in rapidly growing neonates or infestations with bloodsucking parasites.

PROXIMATE MECHANISMS

Iron is required for the last step of heme synthesis. Iron deficiency results in impaired heme production, leading to decreased Hb synthesis. In response to decreased intracellular Hb, erythroid precursor cells undergo additional cell divisions, resulting in progressively smaller cell size.

EVOLUTIONARY MECHANISMS

It has been proposed that when hunting and gathering shifted to agriculture about 10,000 years ago (the Neolithic revolution), a profound change in diet from meat to cereal resulted in a dramatic decrease in dietary iron and an increase in iron deficiency anemia.

COMPARATIVE PHYSIOLOGY



Iron is required for all rapidly growing cells, including hair follicles, nails and mucosal cells, thus explaining hair loss, chipping of nails and glossitis in iron deficiency anemia.



This is an example of an evolutionary mismatch whereby the genetic adaptation to a meat-based diet, honed by millions of years of natural selection, was suddenly overridden by a culturally imposed change in diet.



HISTORY OF MEDICINE

Iron deficiency anemia was recognized as a condition called **chlorosis** (in which patients were described to have a green hue) until the late 1800s. While some patients with chlorosis received treatment with iron, there was no understanding that the condition was caused by iron deficiency. Chlorosis was considered a psychosocial disorder.

NOTES

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