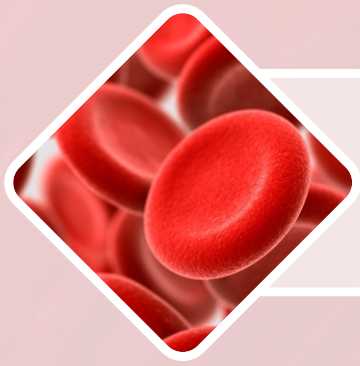
INDIAN DIETETIC ASSOCIATION (IDA)

IRON DEFICIENCY ANAEMIA DAY
26TH NOVEMBER 2020



Iron deficiency anaemia is a multi factorial condition characterised by insufficient red blood cells available to meet the body's physiologic needs resulting into poor oxygen-carrying capacity. [1]

IRON DEFICIENCY ANAEMIA AFFECTS [2]

- Cognitive Performance
- Physical growth esp for infants, toddlers and school going children
- Immunity and morbidity from infections
- Physical capacity and performance at work
- During pregnancy, perinatal risks for the mother and the fetus is increased
- Increases in infant mortality

PREVALENCE OF ANAEMIA IN INDIA [2]

- Pre-schoolers - 41%
- School-age children - 24%
- Female adolescents - 40%
- Male adolescents - 18%
- Children and adolescents in urban areas had a higher prevalence of iron deficiency compared to their rural counterparts

Anaemia is most prevalent among children under two years of age

PHYSIOLOGICAL ROLE OF IRON IN HEALTH AND METABOLISM

The physiologic requirement of iron varies according to one's age, gender, physiological life cycle stage such as different stages of pregnancy, altitude of residence and lifestyle habits such as smoking. [1] Iron requirements increase further during adolescence because of rapid growth.

- Iron is an essential nutrient in development and cell growth in the immune and neural systems, as well as in regulation of energy metabolism and exercise. [3]
- A cofactor for enzymes that synthesize neurotransmitters. [4]
- Important for the neurologic development of infants and children. [3]
- Required for proper myelinization of neurons, neurogenesis, and differentiation of brain cells that can affect sensory systems, learning, memory, and behaviour. Deficiency of iron may cause poor cognitive performance, memory, and may make it difficult to concentrate at the task at hand. [3]
- Iron is present in various proteins in the cells of the human body and has several vital functions (e.g. transporter of oxygen in blood, facilitator of oxygen use and storage in muscles, part of iron-containing enzymes). [4,5,6]

Recommended Dietary Allowances [7]

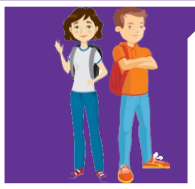
Age	Iron (mg/d)
0-6 months	-
6-12 months	2
1-3 years	6

Age	Iron (mg/d)
Adult Man	11
Adult Woman	15
Pregnant Woman	21
Lactating Woman (0-6 months)	16

Age	Iron (mg/d)
4-6yrs	8
7-9yrs	10
10-12yrs (boys)	12
10-12yrs (girls)	16
13-15yrs (boys)	15
13-15yrs (girls)	17
16-17yrs (boys)	18
16-17yrs (girls)	18

AT RISK POPULATIONS FOR IRON DEFICIENCY ANAEMIA[6]

Infant and young Children



Adolescents

Women of Reproductive Age

Pregnant and Lactating Mothers

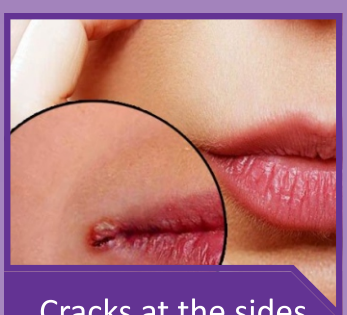
CAUSES OF IRON DEFICIENCY ANAEMIA [6]

- Increased Physiological need eg infancy, pregnancy, lactation
- Poor availability of iron from diets
- Poor intake of iron rich and vitamin c rich foods
- Infections due to poor hygiene / Worm infestations
- Surgery, Trauma, Blood Loss, GI Bleed

Iron deficiency is conventionally considered to develop in 3 stages : iron depletion, iron-deficient erythropoiesis, and iron deficiency anaemia.7

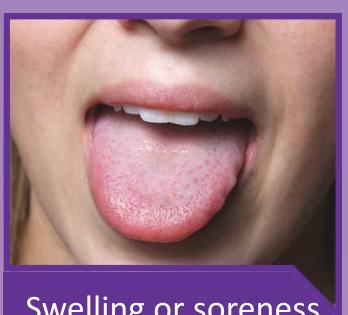
CLINICAL SIGNS AND SYMPTOMS OF IRON DEFICIENCY ANAEMIA [6]

Brittle nails or spooning of the nails

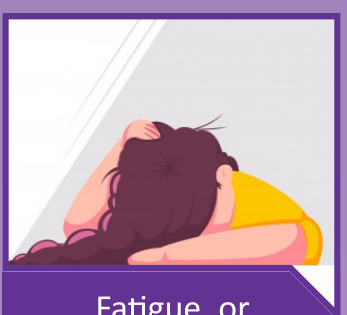


Cracks at the sides of the mouth

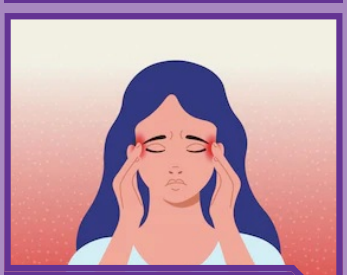
Pale skin



Swelling or soreness of the tongue



Fatigue, or feeling tired



Headache

Irregular heartbeat

PICA

which are unusual cravings for non-food items, such as ice, dirt, paint, or starch

Restless legs syndrome

Shortness of breath, Weakness

DIETARY SOURCES OF IRON

The availability of iron for absorption depends on whether it is heme or non-heme and the presence of enhancers and inhibitors consumed in the meal. The absorption and bioavailability of heme iron (available in animal products) is higher than for nonheme iron. Red meat is the highest heme iron source, while cereals, pulses, vegetables are considered important non-heme iron sources.[6]

Inclusion of vitamin C rich foods like lemon, amla, orange increase the absorption of iron from the diet. [7]

NON-HEME SOURCES OF IRON [7]

Garden Cress Seeds (GCS), Pulses and Legumes, Nuts and Oilseeds, Green Leafy Vegetables

Caution : Garden Cress seeds is not recommended in pregnant women

HEME SOURCES OF IRON [7]

Red meat, Chicken, Fish and Eggs

Phytates, oxalates, tannins and calcium in the diet and tea / coffee / caffeinated beverages may hamper the absorption of iron from the diet. [7]

IRON RICH RECIPE IDEAS

Mutton Curry, Chicken Curry, Steamed Fish, Methi Thepla/Paratha, Shepu Bhaji with Bhakari, Rajma Chawal, Halim Porridge, Halim Laddoo, Groundnuts and Chana, Dates, Halim Coconut Halwa, Methi Khichdi

Vegetarian diets are often poor sources of iron. In order to meet increased physiological need, iron supplementation is recommended for 100 days from the 16th week of pregnancy.

It may be started preconceptionally if the mother is already suffering from iron deficiency anaemia.

In addition to including iron rich foods in the diet, one must also include fortified foods like iron fortified atta, rice, breakfast cereals and double fortified salt to meet the iron requirements. [7] [8]

According to the Food Safety and Standards (Fortification of Foods) Regulations, 2016, staples like Wheat Flour and Rice (with Iron, Vitamin B12 and Folic Acid), and Double Fortified Salt (with Iodine and Iron) should be fortified to reduce the prevalence of Iron deficiency anaemia in India. (FSSAI, 2016) [9]

STRATEGIES FOR INCREASING DIETARY IRON

Use cast iron skillets for preparation of acidic foods such as tomato or kokum based curries and vegetables.

Increase absorption of iron by squeezing lemon on your dals and sabjis after serving in the plate.

Consume non-heme iron sources (eggs, chicken, fish) at least 2-3 times a week as they have higher iron bio availability.

Use iron-fortified wheat flour, rice, and double fortified salt.

Read ingredient labels for iron fortification of cereals and other products.

Consult your doctor / dietitian to know if supplementation is required. Take an iron supplement at a different time than other mineral supplements or multi vitamin / mineral preparations to avoid competitive absorption.

IRON SUPPLEMENTATION [10]

Supplemental forms of iron include ferrous sulphate, ferrous gluconate, ferrous fumarate, ferrous ascorbate, and ferrous bis glycinate.

Elemental iron is the amount of iron present in the supplement and only a fraction of this is absorbed in the body.

Ferrous bis glycinate and ferrous sulfate have better absorbability as compared to other iron salts.

The National Nutritional Anaemia Prophylaxis Programme initiated in 1970, includes beneficiaries from all age groups- children aged 6-59 months, 5-10 yr, adolescents aged 10-19 yr, pregnant and lactating women and women in reproductive age group under the National Iron Plus Initiative (NIPI) programme.

REFERENCES

1. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System. Geneva, World Health Organization, 2011 (WHO/NMH/NHD/MNM/11.1) (http://www.who.int/vmnis/indicators/haemoglobin.Pdf)
2. Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF and Population Council. 2019. Comprehensive National Nutrition Survey (CNNS) National Report. New Delhi
3. Iannotti LL, Tielsch JM, Black MM, Black RE. Iron supplementation in early childhood: health benefits and risks. Am J Clin Nutr. 2006;84(6):261–76.
4. Baker RD, Greer FR; Committee on Nutrition American Academy of Pediatrics. Diagnosis and prevention of iron deficiency and iron deficiency anemia in infants and young children (0-3 years of age). Pediatrics. 2010;126(5):1040-1050.
5. Domellöf M, Braegger C, Campoy C, et al.; ESPGHAN Committee on Nutrition. Iron requirements of infants and toddlers. J Pediatr Gastroenterol Nutr. 2014; 58(1):119-129.
6. Assessing the iron status of populations: a report of a joint World Health Organization/Centers for Disease Control technical consultation on the assessment of iron status at the population level, 2nd ed including literature reviews. Geneva: World Health Organization; 2008
7. Nutrient Requirements of Indians-A report of the Expert Group 2020 [Internet]. 1st ed. Hyderabad: ICMR- NIN; 2020 [cited 20 October 2020]. Available from: https://www.nin.res.in/nutrition2020/RDA_short_report.pdfUNICEF. (2018). Micronutrients. [online] Available at: https://www.unicef.org/nutrition/index_iodine.html [Accessed 9 Apr. 2019].
8. FFRC, FSSAI 2016
9. Name JJ, Vasconcelos AR, Valzachi Rocha Maluf MC. Iron Bisglycinate Chelate and Polymaltose Iron for the Treatment of Iron Deficiency Anemia: A Pilot Randomized Trial. Curr Pediatr Rev. 2018;14(4):261-268. doi:10.2174/1573396314666181002170040

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