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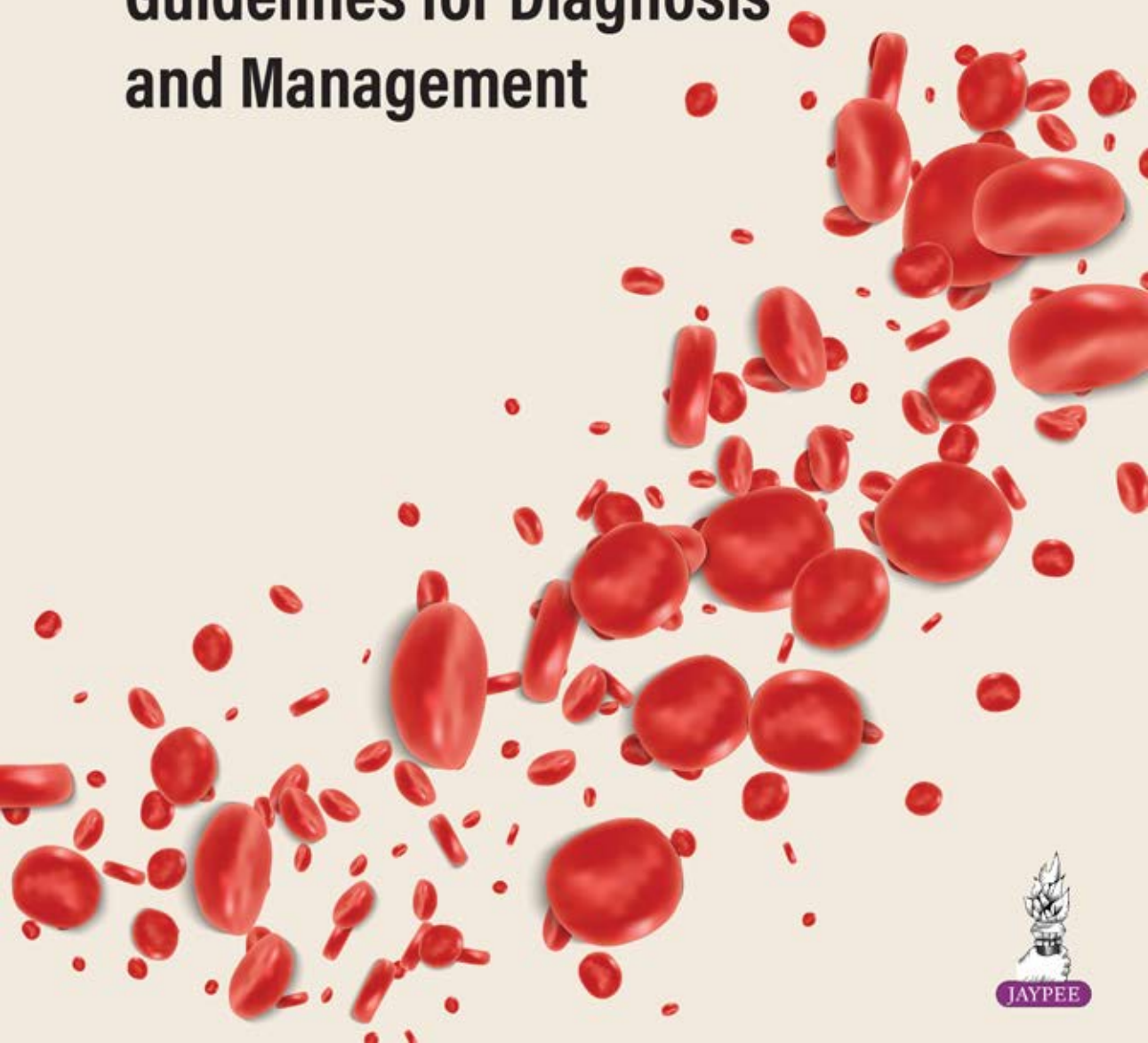
ICH
Nutritional Anaemias in India
Guidelines for Diagnosis and Management



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6

CHAPTER

Guidelines for the Management of Iron-deficiency Anaemia

Hitha Diljith

INTRODUCTION

Iron deficiency is considered as the most common nutritional disorder worldwide. Iron deficiency is defined as a health-related condition in which iron availability is insufficient to meet the body's needs and can be present with or without anaemia.

PREVENTION

Steps for Prevention

Increase the access to iron rich foods, increase the consumption of iron rich foods. But that is not enough, they should be consuming a balanced diet to provide adequate protein, B12 and folic acid as well.

Iron-rich Foods

All the green leafy vegetables (spinach, amaranth, onion stocks, mustard leaves, fenugreek leaves, mint leaves and colocasia leaves) and meat are the primary sources. But iron is available to some extent in cereals such as wheat, ragi, jowar and bajra, pulses, especially sprouted pulses, legumes, fish and poultry, jaggery, groundnuts, whole grains, nuts, germinated seeds, and fermented products, lentils, black gram, soyabean, gingelly seeds, red gram dal, green plantain, black gram dal, watermelon and pumpkin *[Dietary Guidelines for Indians (2010)]*.

Iron Supplementation (Table 1)

Since the prevalence of iron deficiency anaemia (IDA) in India generally is ≥ 40%, iron supplementation is recommended in the following age groups, which is given in **Table 1**.

TREATMENT OF IRON DEFICIENCY ANAEMIA

General Considerations

- Address and treat the primary aetiology, e.g., investigation and treatment for the source of blood loss like gastrointestinal (GI) bleed and menorrhagia.
- Treat intestinal helminth infections.
- Treat *Helicobacter pylori* infection
- Identify all dietary inadequacies by a good dietary history and advice on consuming a proper diet

Goal of therapy in IDA is to correct the anaemia and to provide stores of at least 0.5–1 g of iron. Sustained treatment for a period of 3–6 months after the normalisation of haemoglobin (Hb) is necessary to replete iron stores and normalise ferritin levels.

Oral Iron Therapy

Oral iron therapy is an effective, cheap and easily accessible method to treat IDA. In apparently healthy adults and

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TABLE 1: Prophylactic iron and folic acid supplementation.

Age group	Dose and regimen
Children 6–59 months of age	Biweekly, 1 mL Iron and folic acid syrup. Each mL of iron and folic acid syrup containing 20 mg elemental iron + 100 µg of folic acid
Children 5–9 years of age	Weekly, 1 iron and folic acid tablet. Each tablet containing 45 mg elemental iron + 400 µg folic acid, sugar-coated, pink colour
School-going adolescent girls and boys, 10–19 years of age out-of-school adolescent girls, 10–19 years of age	Weekly, 1 iron and folic acid tablet. Each tablet containing 60 mg elemental iron + 500 µg folic acid, sugar-coated, blue colour
Women of reproductive age (non-pregnant, non-lactating) 20–49 years	Weekly, 1 iron and folic acid tablet. Each tablet containing 60 mg elemental iron + 500 µg folic acid, sugar-coated, red colour
Pregnant women and lactating mothers (of 0–6 months child)	Daily, 1 iron and folic acid tablet starting from the fourth month of pregnancy (that is from the second trimester), continued throughout pregnancy (minimum 180 days during pregnancy) and to be continued for 180 days, postpartum Each tablet containing 60 mg elemental iron + 500 mcg folic acid, sugar-coated, red colour

Source: Ministry of Health and Family Welfare Government of India. (2018). Anaemia Mukt Bharat—Intensified National Iron Plus Initiative (INIPI)—Operational guideline for programme managers. [online] Available from https://www.fitterfly.com/site/pdf/anemia-mukt-bharat.pdf [Last accessed January, 2024].

stable outpatients with mild IDA, oral iron supplementation is sufficient and it is the recommended mode of treatment to correct iron deficient state, provided the tolerance is good and that there is no inflammatory state.

Dose

The minimal dose used for iron supplementation is 60 mg/day. World Health Organization (WHO) guidelines recommend the dose of elemental iron 60–120 mg/day of ferrous sulphate for a minimum period of 3 months to treat IDA in adolescents, adults, and pregnant women. Traditional recommendations for treatment have used upto the dose of 100–200 mg of elemental iron per day. This results in absorption of 50 mg/day. Absorption of non-haem iron is only modest (5–28%). Moreover, high doses may result in reactive oxygen species-mediated toxicity of nonabsorbed iron on intestinal mucosa. The daily doses of elemental iron should not be > 100 mg/day as the body can only absorb 10–20 mg of iron per day.

Low daily doses (e.g., 60 mg) or moderate doses (e.g., 100 mg) every other day may increase both tolerance and efficacy of oral iron supplementation.

Dose of oral iron supplementation in children is 3–6 mg/kg of body weight of a liquid preparation. In nonanaemic young women, with low plasma ferritin levels, providing lower dosages (40–60 mg elemental iron) and avoiding twice-daily dosing was found to maximise fractional absorption due to the reduced effect of absorbed iron on hepcidin release.

In clinical practice, the dose, frequency and timing of oral iron therapy vary widely across regions, depending upon the prevalence of anaemia. The major disadvantage of oral iron therapy is the poor fractional absorption of iron and the GI side effects. The absorption of oral iron is 2–13% when consumed with food and 5–28% when consumed without food. Unabsorbed iron can alter the composition of gut microbiome. Oral iron intake increases hepcidin levels. Hepcidin blocks the absorption of iron given on the next day by down regulation of ferroportin expression on cell surface. Several clinical trials have been conducted

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with different iron dose schedules, to study the influence of iron on hepcidin levels, iron absorption and Hb increment. Divided doses of iron increase hepcidin levels which impair absorption. Recent evidence indicates that single dose, rather than multiple doses per day, increases the efficacy of treatment and has the potential to improve tolerability. Many studies conducted in iron depleted nonanaemic adults have demonstrated that alternate day iron therapy is associated with better fractional absorption of iron than daily dosing and improves the tolerance to oral iron **(Table 2)**. Similar studies conducted in patients with IDA across India have demonstrated that alternate day therapy is equally efficacious as daily therapy.

The data from these trials indicate that:

- Alternate day oral iron therapy is equally efficacious as daily iron therapy.

TABLE 2: Summary of clinical trials investigating daily versus alternate day iron therapy.

Investigator	Randomisation	Elemental iron dose and schedule	Results and conclusion
Moretti et al. Blood 2015 Switzerland/ Netherland/New York	• Young females 18–45 years • Ferritin < 20 µg/L (iron depleted, non-anaemic)	RCT, three study; FeSO4 1. Single daily 40 mg, 60 mg, 80 mg and 240 mg 2. Single daily 60 mg elemental iron × 2 days 3. Twice daily 60 mg elemental iron	• Doses ≥ 60 mg increase hepcidin for upto 24 hours and causes lower iron absorption on the following day. Absorption is higher when dosages are spaced by 48 hours • Absorption is highest at low iron doses (40–80 mg) • Twice daily dose has limited additional effect compared with daily administration
Stoffel NU et al. Lancet Haematol 2017 Zurich, Switzerland	• Young females 18–45 years • Ferritin ≤ 25 µg/L (iron depleted, non-anaemic)	Two RCTs; $FeSO_4$ 1. Fe 60 mg daily × 14 days vs. alternate day × 28 days 2. Fe 120 mg single dose × 3 days 60 mg BD × 3 days	• Iron therapy on alternate days and in single doses optimises iron absorption and is the preferred dose regimen • Suggested need for more studies in patients with anaemia
Deepesh P Lad et al. Ann Hematol. 2020 PGIMER, Chandigarh, India	• 62 patients with IDA, all severity • *Primary endpoint*: Hb rise 2 g/dL	RCT; two arms; $FeSO_4$ • Fe 60 mg BD ($n = 31$) • Fe 120 mg alternate day ($n = 31$)	• Hb rise 2 g/dL was met in significantly more patients in the BD arm at 3 weeks and 6 weeks • More reports of nausea in BD arm • Choice between BD vs. AD regimen should be made based on severity of anaemia, the rapidity of response desired, and patient preference based on side effects

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Investigator	Randomisation	Elemental iron dose and schedule	Results and conclusion
Mehta S et al. J Assoc Physicians India. 2020 SMS Medical College, Jaipur, Rajasthan, India	• 40 patients adults with IDA • Assessed Hb, RET-He, serum ferritin and Hepcidin level	RCT; two arms, $FeSO_4$ • Fe 60 mg alternate day ($n = 20$) • Fe 60 mg daily ($n = 20$)	• Mean Hb ± at D21 was significantly more in AD arm than daily arm • Nausea and metallic taste were more in daily therapy group • AD day single dose oral iron (60 mg of elemental Fe, $FeSO_4$) was more effective and better tolerated than daily therapy
Basheer A et al. Sci Rep. 2023 Feb Pondicherry/Waynad India	• 200 adults with IDA • Assessed mean Hb ↑ at 8 weeks	RCT; two arms, $FeSO_4$ • Fe 120 mg alternate day ($n = 100$) • Fe 60 mg daily	• Mean change in haemoglobin was + 1.05 ± 1.34 g/dL in alternate day arm and + 1.36 ± 1.51 g/dL in daily arm ($p = 0.47$) • No significant difference between AD and daily iron therapy in improving Hb
Kavitha, R et al. Chennai 2020	• 70 patients with IDA • Assessed Hb, RBC indices and ferritin after 16 weeks of therapy	Randomised, Open-Label study; $FeSO_4$ • Fe twice daily ($n = 35$) • Fe alternate day ($n = 35$)	• Alternate day oral iron therapy is equally efficacious as daily therapy and has a slightly more favourable adverse effect profile • Alternate day iron therapy could be the preferred choice for treatment of nonsevere iron deficiency anaemia
Jongkraijakra et al. Thailand 2023	64 patients with IDA	RCT; ferrous fumarate 200 mg • Thrice daily-TID ($n = 32$) • Thrice weekly-TIW ($n = 32$)	• TIW was noninferior (23% margin) to the TID iron treatment of IDA patients with less AEs and costs • Hb response was higher in TID arm at 4 weeks, but similar in TID and TIW arms at 12 weeks

(Hb: haemoglobin; IDA: iron deficiency anaemia; RCT: randomised controlled trial; RET-He: reticulocyte haemoglobin equivalent)

- Once daily iron therapy with elemental iron 60–80 mg is the recommendation for moderate to severe IDA if early correction is needed and intravenous (IV) iron therapy is not deemed necessary.
- Alternate day therapy with 100 mg is recommended in nonsevere IDA and in moderate to severe IDA where patient cannot tolerate daily iron therapy and IV iron therapy is not deemed necessary.
- Gastrointestinal side effects are less with alternate day iron therapy.
- Alternate day iron therapy reduces the pill burden, improves the compliance and cost of treatment.

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- More studies are needed in different patient populations with iron deficient state to gain more insights about the optimal iron dosing regimens.

Oral Iron Formulations (Table 3)

Oral iron preparations are available as ferrous or ferric salts. Ferrous salts have high iron content and are three to four times better absorbed than ferric salts, especially at higher doses. Hence ferrous salts are generally more preferred, widely used and recommended by WHO.

- For standard first-line therapy, the iron preparations recommended are ferrous sulphate, ferrous fumarate and ferrous

TABLE 3: Summary of trials comparing different oral iron preparations.

Investigator	Study population	Oral iron formulation Elemental iron (mg/day)	Results and conclusion
Singhal et al., 2015	250 pregnant women with IDA	Ferrous sulphate (FS) (100 mg), ferrous fumarate 100 mg), ferrous ascorbate (FA) (100 mg), ferrous bisglycinate (30 mg), sodium feredetate (33 mg)	FA and bisglycinate are more effective than FS in treatment of iron deficiency anaemia in pregnancy
Patil et al., 2013	60 pregnant women with IDA	Ferrous fumarate (100 mg), ferrous bisglycinate (100 mg) and carbonyl iron (100 mg)	• No significant difference between the three treatments in relation to increase in Hb • Ferrous fumarate is the best cost-effective iron salt with tolerable side effects
Gamad N et al., 2021	120 pregnant women with IDA	• FS, ferrous fumarate, FA and carbonyl iron • All 200 mg/day	All the four iron salts at the dose of 200 mg are equally effective. Adverse effects were more common in the ferrous fumarate group (56.7%)
Gupta et al., 2020	400 women (antenatal and post-natal)	• FS 50 mg BD • Ferrous fumarate (98.6 mg) • FA (100 mg) • Colloidal iron (suspension) • Ferric ammonium citrate (suspension)	• FA was most efficacious tablet form. Colloidal iron was most efficacious suspension form • FS has maximum side effects
Agarwal MB et al., 2005	60 adults men and women	• FA (100 mg) • Carbonyl iron (100 mg)	Higher response rate with FA (93.33%) than carbonyl iron (46.33%)
Ahmed TN et al., 2021	160 pregnant women	• FS 300 mg/day • Carbonyl iron 150 mg/day	Carbonyl iron is more effective and tolerable than FS in treatment of IDA in pregnancy
Sharma et al., 2012	120 pregnant women	• Ferrous fumarate (100 mg) • FA (100 mg) • Carbonyl iron (100 mg)	FA is superior to Ferrous fumarate which in turn is better than carbonyl iron in efficacy, tolerability and compliance
Chavan S et al., 2021	177 pregnant women	• FS (60 mg BD) • FA (100 mg) • Iron hydroxide polymaltose complex-IPC (100 mg OD)	• FS, FA and IPC have comparable efficacy and safety profile • At 90 days, Hb ↑ with FA was significantly higher than FS

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gluconate. Ferrous sulphate is the established standard for oral iron therapy due to good bioavailability, high efficacy, acceptable tolerability and low cost.

- Other common iron formulations include ferrous ascorbate, ferrous succinate, ferrous glutamate, ferrous lactate, carbonyl iron, ferric citrate, liposomal iron, haem iron polypeptide (HIP) and ferric iron with polysaccharide complexes (PICs).
- Ferrous ascorbate remain soluble in the alkaline pH of the small intestine and can overcome the inhibitory effects of phytates, oxalates and tannates leading to highest absorption (39–67%) among all ferrous salts. There is no risk of iron overload on continuous use due to inhibition of the conversion of ferritin into haemosiderin by ascorbic acid. Ferrous ascorbate has comparable efficacy to ferrous sulphate, quick response, safety, and tolerability.
- *Carbonyl iron*: In carbonyl iron, controlled heating of vaporised iron pentacarbonyl leads to the deposition of uncharged elemental iron as microscopic spheres < 5 in diameter.
- Haem iron polypeptide and PIC have improved tolerability and taste better, but are more expensive. Combining ferric salts with PICs doesn't induce the generation of reactive oxygen species thus resulting in better stability and portability of iron through intestinal mucosa and lesser GI side effects. But data from several studies have demonstrated that therapeutic response to Fe III hydroxide-polymaltose complex was inferior to ferrous sulphate. Ferrous sulphate resulted in a greater increase in Hb at 12 weeks compared with PIC.
- Oral liposomal iron is a unique oral iron formulation characterised by high bioavailability, favourable side effect profile and good compliance. Iron salts like iron pyrophosphate can be incorporated into liposome which consists of lipid bilayer with an internal aqueous cavity. The liposome protects the iron from the gastric acid and the intact liposomal iron reaches the small intestine where it is directly absorbed by the M cells of the intestine and directly liberated into the liver. The oral bioavailability of liposomal iron pyrophosphate is 2.7 times higher than ferrous sulphate and 4.1 times higher than iron gluconate. Incidence of adverse events was less with liposomal iron (3%) compared to conventional oral iron formulations (30%) and IV iron (34.5%). Diarrhoea and constipation were reported in 4.5% patients with liposomal iron intake. These properties make it suitable for patients with intolerance to oral iron, IV iron or lack good absorption. Therapeutic efficacy, safety and tolerability of oral liposomal iron have been proven in anaemia across various clinical conditions like cancer-related anaemia, chronic kidney disease (CKD) patients on dialysis, celiac disease and other GI malabsorption syndromes, post-bariatric surgery and other operative procedures, chronic inflammatory states like systemic sclerosis, hepatitis C infection and cirrhosis with GI bleeding, diabetes mellitus, etc. Oral liposomal iron is a safe and viable treatment option in IDA of pregnancy. The suggested dose is 30 mg/day for 8–12 weeks.
- Haem iron polypeptide is the commercially available haem iron preparation for oral therapy. HIP is produced by hydrolysis of animal source Hb with proteolytic enzymes. In HIP haem porphyrin ring supplies iron to the sites of absorption. Iron in HIP is highly soluble at low pH and has 10 times more bioavailability than nonhaem iron, even when taken with meals. Inhibitors of iron absorption like phytates and tannates do not interfere with absorption of HIP which is bene-

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ficial in Indian scenario. Haem-iron administered to the mother is favourably transported across the placenta to the foetus, thus improving the neonatal iron status. Suzuki et al. have suggested that HIP at average dose of 6.5 mg or maximum dose 9 mg is sufficient to correct iron deficiency in third trimester. HIP helps to maintain sustained normal iron stores in the post-partum period as well. GI upset occurs only in 1.6% of patients receiving oral HIP, ensuring superior tolerability and compliance. Hence HIP is considered as an effective alternative to both oral non-haem and IV iron for treatment of anaemia in pregnancy when either of these are not tolerated.

- Sucrosomial iron (SI), developed in Italy is an innovative iron containing carrier in which ferric pyrophosphate is protected by a phospholipid bilayer membrane plus a sucrester matrix. Sucrester is a surfactant derived from the esterification of fatty acids with sucrose (sucrose esters). Sucrester is an absorption enhancer allowing the molecules to pass through paracellular and trans-cellular routes thus overcoming the intestinal barrier. Addition of other ingredients like tricalcium phosphate and starch forms the final product "sucrosome" which makes it gastro-resistant and is carried through the intestinal tract without side effects. SI bypasses the DMT 1 dependent iron absorption pathway and is absorbed as a vesicle-like structure. SI is well tolerated and highly bioavailable than other iron salts. SI has unique structural, physicochemical and pharmacokinetic characteristics. Clinical efficacy and safety of SI have been demonstrated in various settings like CKD, cancer-associated anaemia, bariatric surgery, inflammatory bowel disease (IBD), celiac disease, autoimmune atrophic gastritis, GI bleeding, pregnancy, etc., where SI was compared with traditional oral iron preparations and IV iron.

  Sucrosomial iron is emerging as a valuable first option to treat uncomplicated IDA in patients who are intolerant to conventional iron salts or in patients who fail to respond to oral iron therapy. Oral SI is also considered as a safe alternative to IV iron for treatment and maintenance in settings where IV iron was the usual treatment option (e.g., CKD, cancer, IBD, bariatric surgery, etc.). More randomised trials are needed to further validate the promising results obtained in preliminary studies before formulating strong recommendations for the use of SI.

  Data from these studies which mainly include pregnant women with IDA conclude that when considering efficacy, tolerability and side effect profile, ferrous ascorbate is a better formulation compared to others, though the differences were not very significant. There are other studies which have shown that efficacy is comparable for different oral iron formulations.

  There is no concrete evidence that one iron formulation is more efficacious than another. Costly iron preparations have no added advantage. Avoid using enteric coated preparations as they are poorly absorbed.

  The Drugs Technical Advisory Board (DTAB) of India has recommended that vitamin B complex and zinc should not be included in iron- and folic acid-containing haematinic preparations. Formulations having iron salts alone or iron along with folic acid and vitamin C are acceptable formulations.Oral iron preparations are available as tablets, elixirs or solutions **(Table 4)**.

Optimal Iron Intake

- Iron should be taken between meals.
- Inhibitors of iron absorption (calcium tablets, foods such as milk, tea and coffee) should be avoided when the iron supplement is taken.

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TABLE 4: Oral iron preparations.

Generic name	Tablet (elemental iron content) mg	Dose	Instructions
Ferrous sulphate	325 (65) 152 (50)	1–2 tablets, once per day or once every other day	• Acidic environment required • Take on empty stomach • Consider vitamin C
Ferrous fumarate	300 (98.6) 152 (64)	1 tablet, once per day or once every other day	• Acidic environment required • Take on empty stomach • Consider vitamin C
Ferrous gluconate	325 (39) 240 (27)	2 tablets, once per day or once every other day	• Acidic environment required • Take on empty stomach • Consider vitamin C
Polysaccharide iron	150 (150) 50 (50)	1 tablet once per day	Can be taken with a meal. Acidic environment not required for absorption
Ferric citrate	210 (210)	1 tablet once per day	Can be taken with a meal. Acidic environment not required for absorption
Ferrous ascorbate	100 (100)	1 tablet once per day	Can be taken with a meal. Acidic environment not required for absorption
Carbonyl iron	50 (50)	1 tablet once per day	Can be taken with a meal. Acidic environment not required for absorption
Liposomal iron	30 (30)	30 mg/day	Can be taken with a meal. Acidic environment not required for absorption
Haem iron polypeptide	12 (12) 398 (11)	1–3 tablets once/day	Can be taken with a meal. Acidic environment not required for absorption

Source: ASH Edu. Book 2019 Noncompliance of Therapy.

- Medications that reduce gastric acidity such as antacids may also impair oral iron absorption and should be avoided.
- Oral iron should be taken 12 hours apart from tetracycline, antacids, proton pump inhibitors (PPIs), H2 antagonists, etc.
- Oral iron taken with vitamin C (orange juice or ascorbic acid) can enhance iron absorption.

Single daily dose (60 mg) or alternate day dose (100 mg) is the recommended dosing regimen.

Efficacy is comparable for daily or alternate day treatment.

Standard first-line treatment of IDA—one tablet per day of ferrous sulphate, ferrous fumarate ferrous ascorbate or ferrous gluconate.

If daily dose is not tolerated, try one tablet every other day, or go for alternative oral preparations.

Monitoring Response to Oral Iron Therapy

- Reticulocytosis starts in 4–5 days, and increases until 8–10 days after treatment, then declines.
- Hb begins to improve by the second week; increases at a rate 0.2 g/dL/day.
- Expected Hb rise is 2 g/dL by 3–4 weeks if adequate doses of ferrous sulphate are consumed.
- Monitor during the first 4 weeks for Hb response to oral iron.
- Once the Hb levels have returned to normal, oral iron should be continued for at least another 4–6 months, provided the cause of iron loss is corrected. This helps to replenish the iron stores.

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initial iron repletion to determine whether ongoing iron supplementation is required.

Perioperative Anaemia

Anaemia in perioperative period is associated with increased morbidity and poor outcomes.

The International Consensus Statement on the perioperative management of anaemia and iron deficiency recommend iron repletion in preoperative patients with ferritin < 30 mg/L, TSAT < 20% or ferritin 100 mg/L in the setting of C-reactive protein > 5 mg/L.

Oral iron therapy is sufficient for surgeries with a lead period of >6 weeks. IV iron replacement is recommended if lead period is >6 weeks.

Management of Iron Deficiency in Chronic Inflammatory Conditions

Anaemia of inflammation (AI), or ACD, is considered the second most prevalent anaemia worldwide (after IDA). ACD constitutes upto 40% of all anaemias worldwide. ACD can occur in cancer and haematological malignancies, infections, immune-mediated diseases, inflammatory diseases, CKD, CHF, chronic pulmonary disease, obesity, anaemia of the elderly and anaemia of critical illness (accelerated course).

Diagnosis of iron deficiency in the setting of inflammation is based on a serum ferritin threshold of <100 mg/L or in combination with TSAT < *20%.*

For diagnosis of iron deficiency in elderly, proposed cut-offs between >30 and <100 mg/L are based on small studies.

During active inflammation, absorption is further reduced from the normal average of 10% as a result of hepcidin-mediated ferroportin inhibition.

In the setting of chronic disease or chronic inflammation, oral iron is ineffective.

Patients with chronic inflammatory conditions like IBD and chronic diseases like CKD, CHFs are intolerant, noncompliant and nonresponsive to oral iron therapy.

Intravenous iron preparations like FCM have good tolerance and efficacy among patients with ACD, and may be used in this patient population.

CONCLUSION

- Management of IDA includes preventive measures like increasing intake of iron rich foods, balanced diet, iron supplementation, treating intestinal helminth infections, identifying and treating sources of blood loss.
- Treatment of IDA by oral iron can be done using ferrous sulphate, ferrous gluconate or ferrous fumarate. The recommended dose of elemental iron is 60 mg once daily or 100 mg alternate day.
- Adequate response to oral iron therapy is 2 g/dL increase in Hb by 4 weeks of therapy. Duration of treatment is for 4–6 months after normalisation of Hb. Monitor blood counts every 6 months initially to monitor recurrence of iron deficiency.
- Parental iron therapy by IV route is recommended in unresponsiveness or intolerance to oral iron therapy and in specific clinical situations. It is safe and well tolerated.
- Recommended preparations are IS, FCM and iron isomaltoside.
- Ferric carboxymaltose and iron isomaltoside may be given as total dose infusion 20 mg/kg/day (1,000 mg) infused over 15–30 minutes.
- Normalisation of Hb occurs after 1–2 months of IV iron supplementation.
- Minor infusion reactions are common with IV iron therapy, but serious adverse events are very rare.

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Guidelines for Diagnosis and Management

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- It tells us how early intervention plays a crucial role in reducing the anaemia burden in this country.
- This guideline is the essential primary step to kickstart the long-drawn process of achieving an anaemia-free India.
- This guideline on nutritional anaemia in India has been collaboratively developed by the ICH-ISHBT, along with members from the ICMR, FOGSI, and API.

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