

Iron deficiency and anaemia in women and girls

Anaemia is an under-recognised and undertreated chronic state that adversely impacts more than 2 billion people worldwide, predominantly women, the fetus and children.¹ Iron deficiency is the most common micronutrient deficiency worldwide and is the most frequent cause of anaemia.¹

Iron deficiency across the life course

- Iron deficiency anaemia (IDA) is a late, not an early, consequence of iron deficiency (ID).²
- While ID can affect individuals of all ages and genders, there is a disproportionate burden of prevalence borne by girls and women of reproductive age, mainly related to menstrual and pregnancy-related iron loss.³⁻⁷
- The symptom of heavy menstrual bleeding (HMB) may exist in as many as 50% of reproductive-aged women, is frequently normalized, and is a major risk factor for the development of ID.^{4,8-11}
- Individuals in many societies and cultures, but especially in LMICs, are at risk for ID, IDA and anaemia from other causes due to food insecurity or cultural or other factors resulting in decreased iron intake.^{4,12}
- Congenital hemoglobinopathies, inadequate vitamin B12, folic acid, celiac disease, and chronic inflammatory states, including parasitic infection, are additional causes or contributors to anaemia and are more commonly found in low and middle-income countries (LMICs).¹²
- Anaemia in women undergoing major gynaecologic surgery is associated with an increased risk of perioperative morbidity and mortality that may not be mitigated by blood transfusion.^{13,14}
- When IDA is diagnosed in women postmenopausally, or in the late reproductive years, there is an increased risk of gastrointestinal malignancy.¹⁵

Impact on pregnancy and the fetus

- IDA is a common diagnosis in pregnancy. It is a recognised risk factor for placental abruption, pre-eclampsia and eclampsia, preterm labour, low birth weight, small for gestational age (SGA) babies, and postpartum hemorrhage.¹⁶⁻¹⁸ It is also associated with increased maternal, perinatal, and neonatal morbidity and mortality.¹⁹
- Even in high-income countries, up to 50% of non-anaemic pregnant women are iron deficient in the first trimester;²⁰ ID will worsen during pregnancy because of the expansion of the woman's red cell mass and placental and fetal iron demands.
- Iron is essential for normal fetal and postnatal neurodevelopment and a broad spectrum of physiological processes, including muscular and neurological function.^{21,22}
- In pregnancy, ID is associated with fetal neurodevelopmental adverse impacts, including increased risks of autism spectrum disorders, intellectual disability, attention deficit hyperactivity disorder, and other enduring psychosocial dysfunction in the offspring.^{23,24} Periconceptual ID, as opposed to that experienced by the fetus in later pregnancy, appears to offer the most significant risk for autism.²⁴

- Due to the prioritisation of iron to haematopoiesis, the adverse fetal neurologic effects of ID occur well before the development of anaemia.²³
- Postpartum anaemia has been linked to depression, fatigue, impaired cognition, lactation failure, and early cessation of breast-feeding.^{25–27}

Iron deficiency anaemia is a significant, global, public health issue

The widespread occurrence of anaemia is a concern in all social strata and age groups, especially in developing countries, and is strongly correlated with low socioeconomic levels. ID without anaemia has been associated with impaired physical and cognitive function and is also associated with congestive heart failure.¹³ ID in early pregnancy is associated with longstanding neurocognitive disorders in children, including increased risks of autism spectrum and intellectual disability.²⁴ In this context, the World Health Organization (WHO) has aimed to reduce the prevalence of anaemia in women of reproductive age by 50% between 2010 and 2025.²⁸

All societies should seek to improve nutrition in their populations, including adequate micronutrients such as iron. However, identifying and effectively treating the causes of HMB while restoring the individual's iron stores would address what appears to be the most common cause of ID and IDA. It would prepare young women in a way that improves their life experience while optimising the development of the fetus in any future pregnancy.

FIGO's position on the issue

ID and IDA are highly prevalent in reproductive-aged girls and women and can profoundly affect their lives and the children. In LMICs, the symptom of HMB appears to be the most common cause or contributor. It is prevalent in women in all socioeconomic strata.

FIGO considers that:

- Detection of iron deficiency anaemia (IDA) iron deficiency (ID) across the life course, its prevention, and effective treatment are achievable on a broad scale.
- Both OBGYNs and primary health care professionals (HCPs) play a crucial role in addressing anaemia, as it is designated by the WHO as a serious global health problem.
- FIGO supports the adoption of broad measures to address this issue, including routine screening of girls and women throughout their life course for ID and anaemia.
- When ID is identified, HCPs should seek to identify and treat the cause(s) of the ID – HMB will be a common historical finding, but one that can be addressed with appropriate and often relatively simple, safe, and effective interventions.
- The worldwide prevalence of HMB is exceptionally high, often associated with ID and IDA, and is often normalised by society, HCPs and even the patient and their family. Women and reproductive-aged girls should be screened for the presence of HMB.
- It is important for all HCPs – including those providing care to women and reproductive-aged girls – to diagnose and treat ID and anaemia from all causes efficiently and effectively.

FIGO recommendations

- All health care systems strive to ensure that their population receives a diet containing appropriate micronutrients, including iron.
- Measurement of haemoglobin (Hb) is the most feasible and pragmatic way of detecting the presence of anaemia.
- It is to be recognised that anaemia is a late sign of ID. Consequently, Hb testing should not be relied on to assess iron status.
- Ideally, all reproductive-aged girls and women should be regularly tested for ID starting from menarche and throughout their life, preferably by measuring serum ferritin and/or, where chronic inflammation is known or suspected, transferrin saturation (TSAT).
- When ID or IDA are identified in nonpregnant women and girls of reproductive age, the symptom of HMB should be suspected and, if identified, appropriately investigated and treated.
- Before planned pregnancy, all reproductive-aged females should have their Hb and iron status assessed and, if deficient, appropriately treated before attempting conception.
- The first-line intervention for ID and mild to moderate IDA is oral iron therapy. Prescribing oral iron should be combined with specific instructions with regards to time and frequency of administration and avoidance of the concomitant ingestion of calcium and phytates or other substances which could hinder absorption.
- It is recognised that orally administered iron frequently is not tolerated and often fails to achieve the therapeutic goal. Alternate day administration may be necessary to optimize treatment outcomes. If a Hb response is not seen by one month, the therapeutic strategy should be reassessed.
- In pregnancy, Hb and iron status should be assessed (reassessed) as early as possible. ID, with or without IDA, should be appropriately treated,
- Routine reassessment of Hb and iron status (if feasible) should occur in all pregnant women at the end of the second trimester, preferably between 26 and 28 gestational weeks.
- If IDA is identified at the beginning of the third trimester, intravenous (IV) iron should be considered, particularly since it has now been shown that, compared to oral iron, IV is more likely to result in normalised neonatal ferritin levels.²⁹
- In cases of severe anaemia (Hb <7g/dL) in either the second or third trimesters of pregnancy, IV iron should be administered. Although safety data on the use of IV iron in the first trimester are limited, use in the first 13 weeks of pregnancy may be deemed appropriate at discretion of the clinician.
- Failure to respond to IV iron is a reason for performing additional tests like a complete (full) blood count, including peripheral smear and Hb electrophoresis, to evaluate for causes of anaemia other than ID.
- At the time of obstetrical delivery, the policy should be delayed clamping of the umbilical cord.
- Measurement of maternal Hb and iron status (if feasible) should be determined immediately postpartum. If deficient, appropriate therapy should be initiated before discharge from the delivering institution or site.
- The Hb and iron status (if feasible) of women should be reassessed at the routine/planned postpartum visit. Identified ID or IDA should be appropriately treated.
- Newborn infants should be routinely evaluated for ID and IDA shortly after birth, particularly if born to women with ID.

- The high prevalence of HMB in women undergoing major gynaecologic surgery justifies screening all patients preoperatively for anaemia.
- Identified anaemia should be corrected prior to major gynaecologic surgery, aiming for a haemoglobin level $\geq 12\text{g/dL}$.
- Upper and lower gastrointestinal investigations should be considered in all postmenopausal women where IDA has been confirmed unless there is a history of significant overt non-GI blood loss.¹⁵

FIGO commitments

FIGO commits to supporting and advocating for improved health care services related to the adverse impact of ID and anaemia. FIGO supports initiatives for appropriate testing and management across all member societies.

FIGO will do so by:

- disseminating and developing resources for healthcare professionals on anaemia management
- influencing all health care systems, policymakers and providers to ensure that they are made aware of the impact of iron deficiency alone or in combination with anaemia on the health and productivity of their populations
- advocating for supportive capacity building for gynaecologists, obstetricians, frontline HCPs, and childbirth educators
- providing resources for supporting data collection and monitoring mechanisms at institutional and country levels for assessing and monitoring existing anaemia care practices.

References

1. WHO. The Global Prevalence of Anaemia in 2011. WHO. Accessed July 1, 2019. https://www.who.int/nutrition/publications/micronutrients/global_prevalence_anaemia_2011/en/.
2. Pasricha SR, Tye-Din J, Muckenthaler MU, Swinkels DW. Iron deficiency. *Lancet*. Jan 16 2021;397(10270):233-248. doi:10.1016/S0140-6736(20)32594-0
3. Scott DE, Pritchard JA. Iron deficiency in healthy young college women. *JAMA*. Mar 20 1967;199(12):897-900.
4. Pasricha SR, Drakesmith H, Black J, Hipgrave D, Biggs BA. Control of iron deficiency anemia in low- and middle-income countries. *Blood*. Apr 4 2013;121(14):2607-17. doi:10.1182/blood-2012-09-453522
5. Kassebaum NJ, Jasrasaria R, Naghavi M, et al. A systematic analysis of global anemia burden from 1990 to 2010. *Blood*. Jan 30 2014;123(5):615-24. doi:10.1182/blood-2013-06-508325
6. Milman N, Taylor CL, Merkel J, Brannon PM. Iron status in pregnant women and women of reproductive age in Europe. *Am J Clin Nutr*. Dec 2017;106(Suppl 6):1655S-1662S. doi:10.3945/ajcn.117.156000
7. Teichman J, Nisenbaum R, Lausman A, Sholzberg M. Suboptimal iron deficiency screening in pregnancy and the impact of socioeconomic status in a high-resource setting. *Blood Adv*. Nov 23 2021;5(22):4666-4673. doi:10.1182/bloodadvances.2021004352
8. Fraser IS, Mansour D, Breymann C, Hoffman C, Mezzacasa A, Petraglia F. Prevalence of heavy menstrual bleeding and experiences of affected women in a European patient survey. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*. Mar 2015;128(3):196-200. doi:10.1016/j.ijgo.2014.09.027
9. Schoep ME, Nieboer TE, van der Zanden M, Braat DDM, Nap AW. The impact of menstrual symptoms on everyday life: a survey among 42,879 women. *Am J Obstet Gynecol*. Jun 2019;220(6):569 e1-569 e7. doi:10.1016/j.ajog.2019.02.048

10. Henry C, Ekeroma A, Filoche S. Barriers to seeking consultation for abnormal uterine bleeding: systematic review of qualitative research. *BMC Womens Health*. Jun 12 2020;20(1):123. doi:10.1186/s12905-020-00986-8
11. Henry C, Filoche S. Reflections on access to care for heavy menstrual bleeding: Past, present, and in times of the COVID-19 pandemic. *Int J Gynaecol Obstet*. Aug 2023;162 Suppl 2:23-28. doi:10.1002/ijgo.14945
12. Chaparro CM, Suchdev PS. Anemia epidemiology, pathophysiology, and etiology in low- and middle-income countries. *Ann N Y Acad Sci*. Aug 2019;1450(1):15-31. doi:10.1111/nyas.14092
13. Richards T, Musallam KM, Nassif J, et al. Impact of Preoperative Anaemia and Blood Transfusion on Postoperative Outcomes in Gynaecological Surgery. *PLoS One*. 2015;10(7):e0130861. doi:10.1371/journal.pone.0130861
14. Murji A, Lam M, Allen B, et al. Risks of preoperative anemia in women undergoing elective hysterectomy and myomectomy. *Am J Obstet Gynecol*. Dec 2019;221(6):629 e1-629 e18. doi:10.1016/j.ajog.2019.07.018
15. Goddard AF, James MW, McIntyre AS, Scott BB, British Society of G. Guidelines for the management of iron deficiency anaemia. *Gut*. Oct 2011;60(10):1309-16. doi:10.1136/gut.2010.228874
16. Hamm RF, Wang EY, Levine LD, Speranza RJ, Srinivas SK. Implementation of a protocol for management of antepartum iron deficiency anemia: a prospective cohort study. *Am J Obstet Gynecol MFM*. Mar 2022;4(2):100533. doi:10.1016/j.ajogmf.2021.100533
17. Rahmati S, Azami M, Badfar G, Parizad N, Sayehmiri K. The relationship between maternal anemia during pregnancy with preterm birth: a systematic review and meta-analysis. *J Matern Fetal Neonatal Med*. Aug 2020;33(15):2679-2689. doi:10.1080/14767058.2018.1555811
18. Omotayo MO, Abioye AI, Kuyebi M, Eke AC. Prenatal anemia and postpartum hemorrhage risk: A systematic review and meta-analysis. *J Obstet Gynaecol Res*. Aug 2021;47(8):2565-2576. doi:10.1111/jog.14834
19. Daru J, Zamora J, Fernandez-Felix BM, et al. Risk of maternal mortality in women with severe anaemia during pregnancy and post partum: a multilevel analysis. *Lancet Glob Health*. May 2018;6(5):e548-e554. doi:10.1016/S2214-109X(18)30078-0
20. Auerbach M, Abernathy J, Juul S, Short V, Derman R. Prevalence of iron deficiency in first trimester, nonanemic pregnant women. *J Matern Fetal Neonatal Med*. Mar 2021;34(6):1002-1005. doi:10.1080/14767058.2019.1619690
21. Lozoff B, Georgieff MK. Iron deficiency and brain development. *Semin Pediatr Neurol*. Sep 2006;13(3):158-65. doi:10.1016/j.spen.2006.08.004
22. Georgieff M. The importance of iron deficiency in pregnancy on fetal, neonatal, and infant neurodevelopmental outcomes. *Int J Gynecol Obstet*. 2023;
23. Georgieff MK. The importance of iron deficiency in pregnancy on fetal, neonatal, and infant neurodevelopmental outcomes. *Int J Gynaecol Obstet*. Aug 2023;162 Suppl 2:83-88. doi:10.1002/ijgo.14951
24. Wieggersma AM, Dalman C, Lee BK, Karlsson H, Gardner RM. Association of Prenatal Maternal Anemia With Neurodevelopmental Disorders. *JAMA Psychiatry*. Sep 18 2019:1-12. doi:10.1001/jamapsychiatry.2019.2309
25. Milman N. Postpartum anemia I: definition, prevalence, causes, and consequences. *Ann Hematol*. Nov 2011;90(11):1247-53. doi:10.1007/s00277-011-1279-z
26. Azami M, Badfar G, Khalighi Z, et al. The association between anemia and postpartum depression: A systematic review and meta-analysis. *Caspian J Intern Med*. Spring 2019;10(2):115-124. doi:10.22088/cjim.10.2.115
27. Butwick AJ, McDonnell N. Antepartum and postpartum anemia: a narrative review. *Int J Obstet Anesth*. Aug 2021;47:102985. doi:10.1016/j.ijoa.2021.102985
28. WHO. *Nutrition: maternal, infant and young child nutrition: draft comprehensive implementation plan*. 2012. A65-11. Accessed August 18, 2023. <https://apps.who.int/iris/handle/10665/78899>
29. Awomolo AM, McWhirter A, Sadler LC, Coppola LM, Hill MG. Neonatal outcomes from a randomized controlled trial of maternal treatment of iron deficiency anemia with intravenous ferumoxytol vs oral ferrous sulfate. *Am J Obstet Gynecol MFM*. Jun 20 2023:101063. doi:10.1016/j.ajogmf.2023.101063

About FIGO

FIGO is a professional membership organisation that brings together more than 130 obstetrical and gynaecological associations from all over the world. FIGO's vision is that women of the world achieve the highest possible standards of physical, mental, reproductive and sexual health and wellbeing throughout their lives. Our work to achieve this vision is built on four pillars: education, research implementation, advocacy and capacity building.

FIGO leads on global programme activities, with a particular focus on sub-Saharan Africa and South East Asia. We advocate on a global stage, especially in relation to the Sustainable Development Goals (SDGs) pertaining to reproductive, maternal, newborn, child and adolescent health and wellbeing, and non-communicable diseases (SDG3). We also work to raise the status of women and enable their active participation in achieving their reproductive and sexual rights, including through addressing female-genital mutilation (FGM) and gender-based violence (SDG5).

We also provide education and training for our Member Societies and build capacities of those in low-resource countries through strengthening leadership, translating and disseminating good practice and promoting policy dialogues.

FIGO is in official relations with the World Health Organization and a consultative status with the United Nations.

About the language we use

Within our documents, we often use the terms 'woman', 'girl' and 'women and girls'. We recognise that not all people who require access to gynaecological and obstetric services identify as a woman or girl. All individuals, regardless of gender identity, must be provided with access to appropriate, inclusive and sensitive services and care.

We also use the term 'family'. When we do, we are referring to a recognised group (perhaps joined by blood, marriage, partnership, cohabitation or adoption) that forms an emotional connection and serves as a unit of society.

FIGO acknowledges that some of the language we use is not naturally inclusive. We are undertaking a thorough review of the words and phrases we use to describe people, health, wellbeing and rights, to demonstrate our commitment to developing and delivering inclusive policies, programmes and services.

For enquiries

Rob Hucker, Head of Communications, Engagement and Events
rob@figo.org +44 (0) 7383 025 731

Referencing this statement

International Federation of Gynecology and Obstetrics. *FIGO Statement: Iron deficiency and anaemia in women and girls*. 2023. Available from: www.figo.org/resources/figo-statements/iron-deficiency-and-anaemia-women-and-girls