

Pre-surgical anemia

Anemia prequirúrgica

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Considering that anemia is one of the most commonly found laboratory findings, we have to say that it is not a diagnosis, but a sign and is defined as a condition in which the number of erythrocytes and hemoglobin (Hb) is below the lower limit of normal and, therefore, the oxygen-carrying capacity of the blood is insufficient to meet the body's needs¹.

Specific physiological needs for Hb vary depending on age, sex, the altitude above sea level at which the person lives, smoking, and the different stages of pregnancy².

The key issue in the assessment of anemia is the definition of the underlying mechanism or pathological process. The World Health Organization has recognized iron deficiency anemia as the most common nutritional problem in the world, with 30% of the population affected³. In Mexico in 2019, it was statistically demonstrated that 34% of women of childbearing age had iron deficiency anemia⁴.

Anemia can be caused by other nutritional deficiencies and inherited or acquired diseases that affect hemoglobin synthesis and red blood cell production or survival.

La anemia de la inflamación, más conocida como anemia de enfermedad crónica, es considerada la segunda anemia más prevalente a nivel mundial (después de la anemia ferropénica)^{5,6}.

Anemia accounts for about 9% of the total global burden of disability in all countries and therefore has significant consequences for human health as well as social and economic well-being. Iron is an essential element and is mainly controlled by dietary intake, intestinal absorption, and iron recycling.

Compounds such as phytate, oxalate, polyphenols, and tannin, found in plants, decrease the absorption of non-heme iron, as do some drugs, such as proton pump inhibitors. Ascorbic acid, folic acid, and gastric acid, on the other hand, facilitate the absorption of iron³.

It is important to make an adequate diagnosis of anemias, if in the blood count, a hypochromic microcytic anemia is detected, it is mandatory to perform kinetic tests or iron profile before prescribing iron orally or intravenously. When normochromic normocytic anemia is detected, studies must be performed to detect renal or thyroid alterations; in the detection of normochromic macrocytic anemia, it is essential to perform studies to detect B12 and folic acid in serum.

Several studies have shown that the risks of pre-operative anemia are: perioperative mortality, acute kidney injury, infections, thrombosis, and if erythrocyte concentrates are transfused, the patient is exposed to the three lesions by conservation of red blood cells that are: 1) Depletion of 2,3-diphosphoglycerate that

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increases the affinity of Hb for O₂, which hinders its transfer to tissues. It occurs in the first 10 days of storage and is recovered 48-72 h after transfusion, 2). Transformation of rigid spherocytocytes that occlude capillaries, and 3) Sulfatation of Hb interferes with the mechanisms of arteriolar vasodilation, which contributes to decreased O₂ supply to tissues and exposes the patient to the risk of thrombosis⁷.

The liberal use of transfusions results in prolonged length of hospital stay, more severe organ failure, and higher mortality rates than non-transfused patients. It should be noted that the decision whether or not to transfuse a patient should not be based exclusively on the level of Hb, the patient's tolerance to anemia should be taken into account, especially in patients with cardiovascular disease. About 91.8% of blood transfusions administered are partially or totally unnecessary⁸.

Several retrospective studies have reported an association between red blood cell transfusion and an excessive risk of mortality and cardiovascular events (heart attack, heart attack, heart failure, and stroke).

Older intravenous iron preparations, such as iron dextran, have been discontinued due to their unfavorable safety profiles with a relatively high incidence of anaphylactic reaction, there is also a risk of reaction with iron sucrose, although lower.

The new intravenous iron molecules are the preferred route of administration in some patients and are increasingly favored due to their rapid correction of Hb and are associated with an even lower risk of adverse events, as is ferric carboxymaltose, se can be safely administered in a single dose of 1000 mg in 15 min; however, two infusions may be required in some patients, depending on their weight and Hb levels and iron deficiency, and may be combined with doses of erythropoietin in some patients^{3,9,10}.

Therefore, it is important to treat anemia before subjecting the patient to a scheduled surgical event to avoid complications in the perioperative period and avoid blood transfusion.

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Protection of people and animals. The authors declare that no experiments were carried out on humans or animals for this research.

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References

1. Lin JC. Approach to Anemia in the Adult and Child. Hematology: Basic Principles and Practice. 7th ed., Ch. 34. Netherlands: Elsevier; 2018. p. 458-67.
2. World Health Organization. Haemoglobin Concentrations for the Diagnosis of Anaemia and Assessment of Severity. Geneva: World Health Organization; 2011. Available from: https://who_nmhd_nhd_mnm_11.1_spa.pdf
3. Kumar A, Sharma E, Marley A, Samaan MA, Brookes MJ. Iron deficiency anaemia: pathophysiology, assessment, practical management. *BMJ Open Gastroenterol.* 2022;9:e000759.
4. Mejía-Rodríguez F, Mundo-Rosas V, Rodríguez-Ramírez S, Hernández-FM, García-Guerra A, Rangel-Baltazar E, et al. Alta prevalencia de anemia en mujeres mexicanas en pobreza, Ensanut 100k. *Salud Publica Mex.* 2019;61:841-51.
5. Tomas Ganz. Anemia of Inflammation, *N Engl J Med.* 2019 Sep 19;381(12):1148-1157. doi: 10.1056/NEJMra1804281.
6. Weiss G, Ganz T, Goodnough LT. Anemia of inflammation. *Blood.* 2019;133:40-50.
7. Guía Sobre la Transfusión de Componentes Sanguíneos y Derivados Plasmáticos. 5th ed. Spain: Sociedad Española de Transfusión Sanguínea y Terapia Celular; 2015.
8. Jadwin DF, Fenderson PG, Friedman MT, Jenkins I, Shander A, Waters JH. Determination of unnecessary blood transfusion by comprehensive 15-hospital record review. *Jt Comm J Qual Patient Saf.* 2023;49:42-52.
9. Christoph W, Meybohm P, Neef V. Conceptos actuales en el manejo de la anemia preoperatoria en obstetricia. *Opinión Actual Anestesiología.* 2023;36:255-262.
10. Lasocki S, Pène F, Ait-Oufella H, Aubron C, Ausset S, Buffet P, et al. Management and prevention of anemia (acute bleeding excluded) in adult critical care patients. *Anaesth Crit Care Pain Med.* 2020;39:655-4.