In the Name of GOD

Anemia and Pregnancy

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http://perinatalrc.sums.ac.ir

WHO & ACOG define anemia in pregnancy as follows

First trimester – Hemoglobin <۱۱ **g/dL** (approximately equivalent to a hematocrit <۳۳ percent)

Second trimester – Hemoglobin <۱۰.۵ **g/dL** (approximate hematocrit <۳۱ or ۳۲percent)

Third trimester – Hemoglobin level <۱۱ **g/dL** (approximate hematocrit <۳۳percent)

World Health Organization (WHO) estimates
that over ۴۰ percent of pregnant women globally have anemia

(WHO):

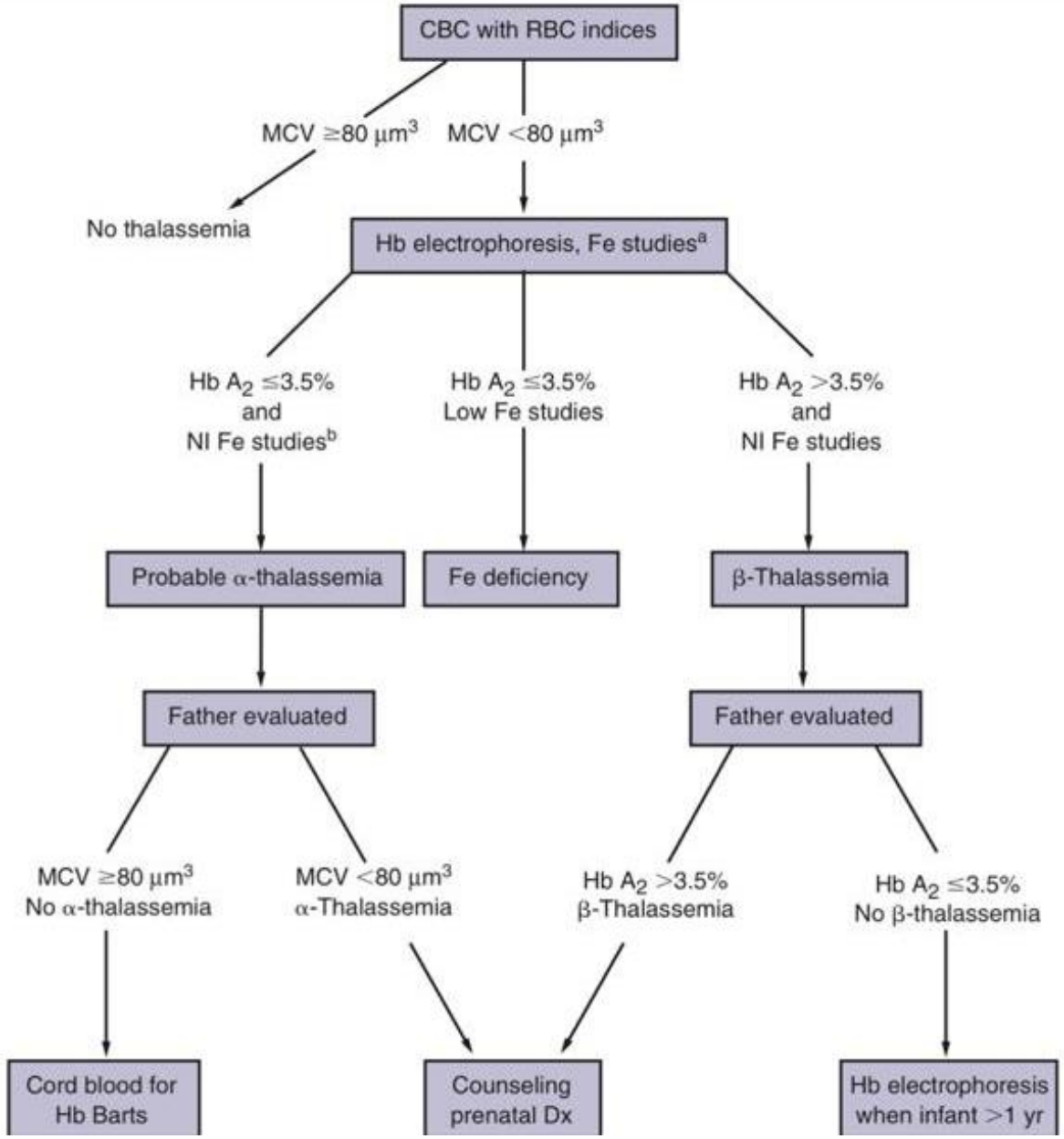
Severe antenatal or postnatal maternal anemia (of any type) was associated with an increased risk of maternal death .

In other studies, maternal anemia was associated with several **adverse pregnancy outcomes such as antenatal/postnatal sepsis, preterm birth, SGA and admission to a neonatal intensive care unit**

In mothers with iron deficient anemia, increasing severity of maternal anemia has been associated with decreasing neonatal hippocampal volume and production of brain-derived neurotrophic factor.

EVALUATION OF

ANEMIA


CBC with RBC indices
MCV ≥80 μm3
MCV <80 μm3
No thalassemia
Hb electrophoresis, Fe studies[a]
Hb A2 ≤3.5% and NI Fe studies[b]
Hb A2 ≤3.5% Low Fe studies
Hb A2 >3.5% and NI Fe studies
Probable α-thalassemia
Fe deficiency
β-Thalassemia
Father evaluated
Father evaluated
MCV ≥80 μm3 No α-thalassemia
MCV <80 μm3 α-Thalassemia
Hb A2 >3.5% β-Thalassemia
Hb A2 ≤3.5% No β-thalassemia
Cord blood for Hb Barts
Counseling prenatal Dx
Hb electrophoresis when infant >1 yr

MCV is an unreliable marker of iron deficiency in pregnancy. Stimulation of erythropoiesis leads to a physiologic increase in MCV during gestation that counterbalances the microcytosis of iron deficiency.

A low MCV, defined as an MCV ,۸۰ fL, is highly sensitive,but not specific, for iron-deficiency anemia

Serum ferritin levels <۱۲ ngmL−۱ indicate established ID.
A serum ferritin level<۳۰ ngmL−۱, with or without anaemia, indicates insufficient body iron reserves and should prompt treatment.
However, as ferritin is an acute-phase reactant, a serum ferritin level within the normal range may not rule out ID in the presence of
Inflammation, SLE, Chronic renal disease ,DM

Clinical judgment for the decrease and the need for (and aggressiveness of) further evaluation:

As an example, in an individual with a baseline hemoglobin of ۱۴ g/dL that decreases to ۱۱ g/dL associated **with macrocytosis**, checking a reticulocyte count and testing for vitamin B۱۲ and folate deficiencies is reasonable.

For an individual with a baseline hemoglobin of ۱۴ g/dL that decreases to ۱۱ g/dL **without macrocytosis**, testing for iron deficiency and vitamin B۱۲and folate deficiencies is reasonable.

Evaluate for other causes of anemia if :

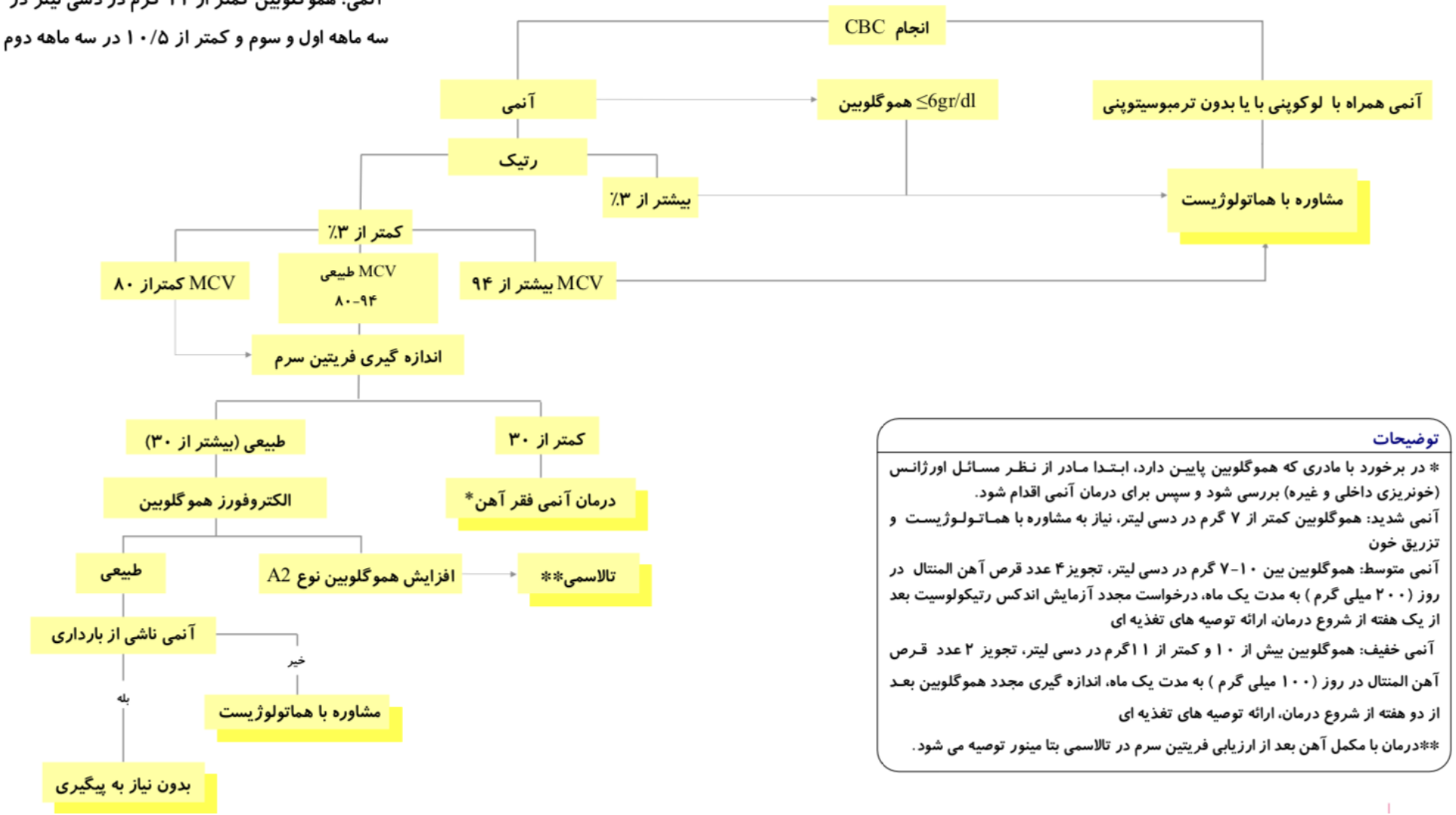
Extreme microcytosis (eg, mean corpuscular volume [MCV] <۸۰ fL), suggestive of
thalassemia

Macrocytosis (MCV >۱۰۰ fL), suggestive of vitamin B۱۲ or folate deficiency or reticulocytosis due to hemolysis

Other cytopenias such as thrombocytopenia or neutropenia
Abnormally high white blood cell (WBC) count or platelet count
Abnormal RBC or WBC morphologies
Failure of the anemia to correct with iron supplementation

آنمی

آنمی: هموگلوبین کمتر از ۱۱ گرم در دسی لیتر در سه ماهه اول و سوم و کمتر از ۱۰/۵ در سه ماهه دوم



توضیحات

* در برخورد با مادری که هموگلوبین پایین دارد، ابتدا مادر از نظر مسائل اورژانس (خونریزی داخلی و غیره) بررسی شود و سپس برای درمان آنمی اقدام شود.

آنمی شدید: هموگلوبین کمتر از ۷ گرم در دسی لیتر، نیاز به مشاوره با هماتولوژیست و تزریق خون

آنمی متوسط: هموگلوبین بین ۱۰-۷ گرم در دسی لیتر، تجویز ۴ عدد قرص آهن المنتال در روز (۲۰۰ میلی گرم) به مدت یک ماه، درخواست مجدد آزمایش اندکس رتیکولوسیت بعد از یک هفته از شروع درمان، ارائه توصیه های تغذیه ای

آنمی خفیف: هموگلوبین بیش از ۱۰ و کمتر از ۱۱گرم در دسی لیتر، تجویز ۲ عدد قرص آهن المنتال در روز (۱۰۰ میلی گرم) به مدت یک ماه، اندازه گیری مجدد هموگلوبین بعد از دو هفته از شروع درمان، ارائه توصیه های تغذیه ای

**درمان با مکمل آهن بعد از ارزیابی فریتین سرم در تالاسمی بتا مینور توصیه می شود.

ACOG :Screen all pregnant women for anemia at the first prenatal visit with a complete blood count (CBC), along with other appropriate prenatal testing, repeat screening with a CBC at week ۲۴ to ۲۸.

All pregnant women should by typed for blood groups (ABO and D) and screened for the presence of red cell **antibodies early** in pregnancy (at booking) and at ۲۸weeks gestation. In D-negative women, the ۲۸-week sample should be taken before the administration of routine antenatal anti-D Ig prophylaxis

The direct Coombs test uses anti–human immunoglobulin to detect immunoglobulins attached to the surface of RBCs.

A positive test indicates an immune cause for a hemolytic anemia

In a woman with microcytic or normocytic anaemia, iron deficiency (ID) should be confirmed by a trial of oral iron.

Anaemic women with a known haemoglobinopathy should have their serum ferritin checked and should only be offered oral iron therapy if their serum ferritin level is <۳۰ ngmL

Prevention

In areas with a high prevalence of anaemia in pregnancy, daily oral iron (۳۰–۶۰mg) and folic acid (۴۰۰ μg) supplementation are as part of routine from first antenatal care

In areas with a low prevalence of anaemia in pregnancy, non-anaemic women identified to be at an increased risk of ID should have their serum ferritin checked early in pregnancy and be offered oral supplements (۳۰–۶۰mg/day) if serum ferritin is <۳۰ ngmL

All pregnant women, especially those with antenatal anaemia, have an Hb determination prior to delivery

Hb concentration be determined in all women after significant peri-partum bleeding

Prevention

Every effort be made to correct anaemia prior to delivery

Treatment of iron deficiency that is initiated after diagnosis of iron deficiency anemia
may be **too late to prevent some adverse** outcomes.
Correction of iron deficiency before
the third trimester is ideal, as iron-dependent neurogenesis is maximal during the third trimester and early neonatal life, and iron deficiency during this period has been associated with **deficits in neurocognitive development**

Thank you for your attention