Neonatal anemia

2013/04 (訂)

A. **cause**

a. <u>blood loss</u> (the most common cause)-

(1) obstetrical cause: placental abruption, placenta previa, trauma to placenta or umbilical cord, etc.

(2) feto-maternal transfusion: 8% of normal pregnancies

(3) feto-placental transfusion

(4) twin to twin transfusion: occur only with monochorionic twins

(5) internal hemorrhage: ICH, subgaleal hemorrhage, adrenal hemorrhage, etc

(6) introgenic blood loss: secondary to sampling of blood for lab tests, the commonest cause of anemia in small preterm infants

b. <u>RBC destruction increase</u>

(1) intrinsic cause-

RBC enzyme defects (G6PD def)

RBC membrane defects (hereditary spherocytosis)

Hemoglobinopathies (α thalassemia)

(2) extrinsic cause-

* immune hemolysis- Rh/ABO incompitability, hemangioma (kasabach merritt syndrome)

* acquired hemolysis- infection, vit E def (rare), drugs

c. <u>RBC production decrease</u>

(1) anemia of prematurity due to transient deficiency of EPO

(2) aplastic or hypoplastic anemia (eg. Diamond-blackfan syn)

(3) bone marrow suppression (eg. with rubella or parvovirus B19 infection)

(4) nutritional anemia (eg. iron def.)

B. **clinical finding**, vary with the severity of anemia, including-

pallor, tachycardia, tachypnea, apnea, increase O2 requirement, lethargy, poor feeding, HSM, jaundice, wide pulse pressure, hypotension, metabolic acidosis with severe anemia, decrease tolerance of labor with fetal anemia

C. **diagnostic evaluation**-

(1) History

(2) Lab evaluation: CBC, PB smear, reticulocyte count, Blood type, Coombs test, T/D bilirubin, KB test, sono for internal bleeding

* hemoglobin electrophoresis and RBC enzyme

* Bone marrow aspiration

D. **management**- depend on cause and severity of anemia

(1) prenatal- fetal transfusion

(2) postnatal-

* anemia of prematurity- limit blood drawing
  treat with EPO
  transfusion with pRBC
* other cause of anemia- treat underlying disease, transfusion if indicated
* **severe anemia**- suggest ***partial exchange transfusion***

When severe, symptomatic anemia, the infant's cardiovascular system may not be able to tolerate the increased blood volume from simple transfusion of pRBCs.

$$\text{Volume of pRBCs for exchange} = \frac{(\text{Desired Hct} - \text{Pt Hct}) * \text{BW (kg)} * 90\text{cc/kg}}{\text{pRBC Hct} - \text{Pt Hct}}$$

Table. Average hematological values for term and preterm infants

GA (wks)	Hct (%)	Hb (g/dL)	reticulocyte (%)
37-40	53	16.8	3-7
32	47	15.0	3-10
28	45	14.5	5-10
26-30	41	13.4	--