Anemia Of Prematurity

Characteristics

- Occurs during the normal developmental switch from fetal to adult hemoglobin synthesis.
- Immediately after birth, the increase in blood oxygen content results in the downregulation of erythropoietin.
- Once hemoglobin level decreases enough, tissue oxygen needs are greater than oxygen delivery, and erythropoietin production increases.
- Anemia is more profound and occurs earlier in premature infants due to:
  - Blood loss from sampling.
  - Short survival time of RBC's (40-60 days compared to adult 120 days, and term infant 60-80 days).
  - Suboptimal erythropoietic response.
  - Relatively more rapid rate of growth than in term infants.
- Usually reach nadir of 7-10 g/dL at 4-8 weeks of life.
- Normocytic, normochromic, hypoproliferative anemia.
- Premature infants may have lower iron stores despite iron supplementation; consider iron deficiency anemia as an etiology for persistent or progressive anemias.

Monitoring

- May check hematocrit and reticulocyte count periodically, but most babies can be managed by watching for symptoms (tachycardia, tachypnea, apnea and bradycardia, poor weight gain, oxygen requirement, diminished activity, pallor, poor feeding).

Treatment

- Healthy asymptomatic newborns will self correct, provided their iron intake is adequate.
- Transitional formulas and fortified breast milk provide approximately 2 mg/kg/day of iron.
- Iron administration before 10-14 weeks of age does not reduce the nadir, but iron is stored for later use.
- Full-term infants should receive 1 mg/kg/day of iron supplementation from age 4 months to 1 year.

- Premature or low-birthweight infants (<2500g) should receive 2 mg/kg/day from 2 months to 1 year (from iron enriched formula or 1 mL multi-vitamin with iron).
- No strong evidence to favor use of erythropoietin.
- Infants with significant respiratory disease or congenital heart disease may need a hematocrit maintained >40 gm%.
- Infants with a hematocrit <25 gm% and symptoms may require red blood cell transfusion.
- For infants requiring blood transfusion:
  - [Insert contact information for appropriate specialist or department.]
  - Order: PRBC, leukocyte poor, irradiated, CMV negative, 15 ml/kg.
  - If the baby is very fluid sensitive (e.g., chronic lung disease), IV lasix 1 mg/kg immediately after transfusion may be indicated.