Vitamin K and Hemorrhagic Disease of the Newborn

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Topics

• 1. Disease
• 2. Vitamin K
• 6. Summary of PH importance
• 7. References
Primary (classic) HDN

- Often fatal condition
- Diffuse hemorrhage in otherwise healthy infant
- During the first 2-7 day of life
- Particularly in low birth weight babies
- Results of low levels of prothrombin and other vitamin K dependent clotting factors, (Factors II, VII, IX and X) caused by vitamin K deficiency
- Incidence between 2.5 to 17.0 per thousand newborns not given vitamin K prophylactically
Causes

- Poor placental transfusion of V.K
- Marginal V.K in breast milk
- Inadequate milk intake
- Sterile gut.

Rarely in formula feeding baby
(supplement of 4-100 microgram V.K)
Early form

- At 24 hours after labor
- Related to maternal use of medication interact with V.K store (anticoagulant)
- Includes bleeding intracranial, gastrointestinal bleeding
Late HDN

• Between 2-12 weeks of life,
• Especially in breast-fed babies.
• Immaturity of liver affects production of clotting factors
• Late HDN primarily in breast fed infants without or inadequate vitamin K rates of 4.4-7.2/100,000 live births
• The cause is malabsorption
Common Clinical Manifestations

• Bleeding in the
  - gastrointestinal tract
  - urinary tract
  - umbilical stump
  - nose
  - scalp
  - intracranial hemorrhage
  - Shock
  - death
Renewed Interest in Vit K

• Since the 1980s attention - UK, Europe, Japan, Canada, Australasia and Middle East
• HDN and vit K deficiency reported in both developed and developing countries where it is not routinely used, or where use may be waning
• Controversy re oral versus parenteral use of routine Vit K largely resolved
• Intramuscular administration within the first 6 hours after birth more effective in preventing both early and late HDN
Labratery test

- Platelet count decrease
- Hb level decrease
- PT, PTT
- Fibrinogen level (decrease in liver disease)
- Bleeding time (premature = 1.3-3.4 mint)
disseminated intravascular coagulation (DIC)

- Pathologic process result in depletion of plasma clotting factors and platelet
- Commonly in preterm neonate
- Prognosis poor
Clinical presentation

- Petchea
- GI bleeding
- Oozing from venipuncture
- General bleeding
- Hematuria
Lab test

- Prolonged PT, PTT
- Low level of clotting factors
- General depletion in clotting factors
Treatment

- Treat underlying cause
- V.K 1.0 mg
- Fresh frozen plasma
- Replacement of missed factors
- Platelet transfusion
inherited abnormality oh clotting factors

- Sex-linked recessive (hemophilia A, B)
- Autosomal dominant (Von Willebrand disease, deficiency in 9 factors)
- Autosomal recessive (deficiency in 6, 7, 8, 9 factors)
Anemia in neonate

• Hb in term infant = 17 mg/dl
• Preterm infant 14-20 mg/dl

• In healthy term infant hemoglobin decline gradually to reach 11 mg/dl at 8-12 week (physiologic anemia)
Etiology of anemia

- Loss of blood or hemorrhage (most common)
- Increase destruction of RBCs (Hemolytic anemia)
- Underproduction of RBCs (less common) hypoplastic anemia
Hemorrhage

• Fetal :-
  Spontaneous 8%
  After amniocentesis
  Twin - twin transfusion

• Placental :-
  Placenta previa
  Abruptio placenta
  Placenta incision during cesarean section
Hemorrhage

- Umbilical cord bleeding
- Neonatal hemorrhage
  - Intracranial bleeding
- Hepatic rupture
- Renal hemorrhage
Hemolytic anemia

• Immune
  blood group incompatibility
  drug induced ( penicillin )
• acquired red blood cell disorder:
  infection , vitamin E deficiency
hypoplastic anemia

- Congenital (leukemia)
- Acquired (infection, suppression by drug)
- Lab test:
  - CBC, blood film, Coombs test, blood group,
Management

- Monitor Hb, hematocite
- Transfusion
- Nutritional supplementation

1. Premature supplement with 2mg/kg/d iron start at 2 month of age
2. Weight 1,000gm with 4mg/kg/d iron start at 2 month of age
3. Folic acid supplement 1-2 mg/week preterm and 0.05 mg/d term

Premature has less erythropoietin so it should pharmacological supplement
Summary

- Deficiency of Vit K remains a significant worldwide cause of neonatal morbidity and mortality
- Routine prophylactic use of vitamin K should always be used to prevent HDN (“good public health practice”)
- Administration by intramuscular injection (0.5-1.0 mgm) within 6 hours of birth is preferable
- May be given orally as 3 doses spread over the first 4 weeks of life
- Vit K showing up in literature on osteoporosis
- A safe, inexpensive preventive procedure that should be mandatory component of newborn care.