



Neonatal Isoerythrolysis Pathogenesis

- Immune mediated hemolytic anemia
- Mediated by maternal anti-RBC antibodies
 - Colostrum

Neonatal Isoerythrolysis Pathogenesis

- Foal inherits specific RBC Ag from the sire
- Dam does not have these Ag
- Dam previously sensitized
 - Placental bleeding - previous pregnancies
 - Previous whole blood transfusion
 - Equine biologics
 - Plasma contaminated with RBC Ag

Neonatal Isoerythrolysis Pathogenesis

- Current pregnancy mare re-exposed
- Mounts antibody response
- Concentrates antibodies in colostrum
- Foal absorb the colostral Abs
- Hemolytic Anemia

Neonatal Isoerythrolysis Pathogenesis

- 32 blood group antigens in horses
- Aa and Qa 90% of the reactions
- R and S groups most of the rest
- Based on gene frequencies
 - TB, QH, Saddlebred, - Qa & Aa
 - Standardbred, Morgan - Aa (not Qa)
 - Arabian - Qa

Neonatal Isoerythrolysis Clinical signs

- Onset
 - 8-120 hours old
 - Depends on amount of antibody absorbed
 - Titer in colostrum
 - Amount ingested
 - More antibody absorbed
 - More rapid the onset
 - More severe the disease

Neonatal Isoerythrolysis Peracute disease

- Severe, acute anemia (massive hemolysis)
 - No hypoxemia
 - Tissue hypoxia
 - Metabolic acidosis
 - MODS

Neonatal Isoerythrolysis Peracute disease

- Normal at birth
- Sudden onset
- Weakness
- Tachycardia
- Tachypnea
- Collapse

Neonatal Isoerythrolysis Peracute disease

- Neurologic derangement
- Fever or hypothermia
- Cardiovascular collapse
- Shock
- Death - often before icteric

Neonatal Isoerythrolysis
Acute disease

- Normal at birth
- Progressive weakness
- Icterus (may become extreme)
- Exercise intolerance
- Tachycardia
- Tachypnea
- Fever (secondary to hemolysis)
- Hemoglobinuria

Neonatal Isoerythrolysis
Subacute disease

- Normal at birth
- Only sign may be icterus
- Can be febrile
- Can have brief hemoglobinuria
- Mild tachycardia/tachypnea
- May go undetected

Neonatal Isoerythrolysis
Lab data

- Anemia - mild to severe (as low as 4-8%)
- Plasma very icteric
- Plasma may be pink
- Hyperbilirubinemia - primarily unconjugated

Neonatal Isoerythrolysis Test before foal nurses

- Hemolytic test
 - Dam's serum
 - + foal's RBC
 - + complement
 - Not easily done on farm
- Jaundice Foal Agglutination Test
 - Does not test hemolysis
 - But good correlation with it
 - Easy procedure
- Whole blood cross match

Neonatal Isoerythrolysis Treatment

- If signs during first 24 hours
 - for first 36 hrs
 - Strip colostrum from mare
 - Discard - do not feed to other foals
 - Don't allow nursing
 - Separate foal from mare
 - Muzzle foal and cover udder
 - Find foal alternate source of colostrum

Neonatal Isoerythrolysis Treatment

- Most important - minimize stress
 - Difficult since otherwise normal
 - Need to be confined - blood samples
- Monitor PCV (serial samples needed)
- Watch for hemolytic episodes
 - Fever
 - Hemoglobinuria
 - Tachypnea, Tachycardia
 - Muscle fasciculations

Neonatal Isoerythrolysis Treatment

- Particularly susceptible to infections
 - Insure adequate IgG
 - Antimicrobial therapy in severe cases
- Maintain adequate nutrition, hydration
- Monitor renal function

Neonatal Isoerythrolysis Blood transfusion

- PCV in low teens
- PCV is dropping rapidly
- When signs of severe anemia are present
 - Even if PCV is not extremely low
 - Monitor lactate
 - Monitor HR

Neonatal Isoerythrolysis Blood transfusion

- Whole or packed cells
- Mare's washed RBC
- Aa and Qa Ag negative donor
- Cross-matched blood

Neonatal Isoerythrolysis Blood transfusion

- Cross-match
 - Major side compatibility
 - Minor will not be compatible
 - Foal's RBC's already coated with Ab
 - Autoagglutinate or autohemolize
- Transfused RBC (if well matched)
 - Nearly normal life span
 - Unlike older horses

Neonatal Isoerythrolysis Prevention - Identify mares at risk

- If mare has had an NI foal
- Can blood type mare and stallion
 - Breed based on blood groups
 - Predict likelihood of problem
- Test mare's sera
 - In late pregnancy
 - Run the JFA test before foal nurses

Neonatal Isoerythrolysis Prevention - Take measures at birth

- Cover udder in late pregnancy
- Attend birth
 - Before foal nurses & for first 36 hrs
 - Separate foal/mare
 - Muzzle foal and cover udder
 - Strip colostrum from mare
- Alternate source colostrum/nutrition

Neonatal Isoerythrolysis
Sequela

- Kernicterus
- Iron Toxicity
 - Liver failure
