

Failure of Passive Transfer (FPT), Equine

Extended Version

Classic case – Newborn foal, **weak at birth**, does not nurse or **nurses poorly**,
-or-
Strong foal but **dam has low or no colostrum** or **poor quality colostrum**.

Presentation:

FPT is not a disease. FPT is a common secondary problem.

FPT does not cause infection in foals but it does predispose them to develop infection.

FPT = inadequate serum levels of immunoglobulins measured at 18 - 24 hours of birth

Risk factors: prior probs in mare/foals – abortion, early embryonic loss; repeated breedings required

Clinical Signs: FPT likely when any of the following are present:

Mare:

- No/poor udder development in mare – colostrum poor quantity
- Premature lactation – lose colostrum
- Udder too full – foal not nursing properly

Foal

- Strong, alert but nursing too often, for short periods, seems hungry all the time; or
- Unable to rise and nurse properly (or often enough) but otherwise alert, hungry; or
- Sleeping more than usual, not nursing often or strongly; or
- Obviously ill, recumbent, not nursing or
- Meconium impaction – colostrum helps pass the sticky stuff – LOOK for FPT

Closure of GI tract begins as soon as enteral intake starts;

< 25% capacity left after 3 hrs;
if milk is given first – gut closes faster

Test(s) of choice:

Serum IgG - Measure by 12 hours – so you can Rx FPT or partial FPT

- Low serum Ig levels in foal > 24 hours of age
- **< 400 mg/dl = failure of passive transfer**
- 400-800 mg/dl = partial failure passive transfer
- > 800 mg/dl = normal

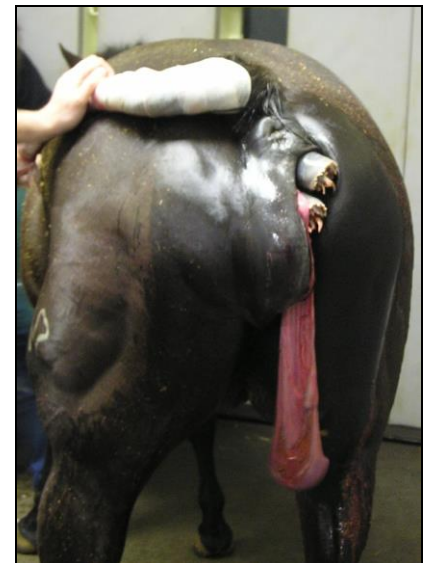
Radial immunodiffusion (RID) = gold standard; but test takes 24 hrs

Foal side tests

- SNAP® Foal IgG test - ELISA based – IDEXX
- Gamma-check-E®
 - Glutaraldehyde based – Plasvacc
 - NOT for obviously sick foals - ↑ fibrinogen = false positive

Mare tests

- Gamma-check-C®
 - Measures IgG in colostrum,
 - Use in problem mares, high risk pregnancies, prelactation



Foals born following dystocia are more likely to be weak. Increased risk of FPT

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Rx of Choice:

Early FPT diagnosis --- < 12 hrs

- **Colostrum** – equine is best
 - substitute bovine colostrum in emergency
 - (some disagree – say use only equine colostrum)
- Oral IgG – often need more than label dose
- IV serum products – need much more than label dose
- Equine Plasma IV
 - Several companies
 - Hyperimmune products available – *Rhodococcus*, *E. Coli*

Late FPT diagnosis --- after 18-24 hrs

- **Plasma transfusion IV**

Domperidone to mare prior to parturition or post foaling if no udder development

Prevention:

1. Evaluate colostrum pre-partum;
 - Measure colostrum specific gravity (> 1.060 = good)
 - Or measure IgG
 - Or estimate colostral IgG concentration via sugar refractometer (>30% = good)
2. Closely monitor mares in the last few weeks pre-partum
3. Maintain colostrum bank –
 - 250 ml colostrum from each mare usually OK
 - A and Q negative blood types best to avoid isoerythrolisis
4. Have private, quiet, clean foaling stall/pasture
5. **BE PRESENT at foaling**
6. Monitor size of mare's udder and foal's attempts to nurse
7. Help foal nurse if needed BUT DO NOT interfere with mare/foal bonding, esp. in maiden mare

Prognosis:

FPT is very correctable with early identification and treatment.

FPT does not always = infection;

-but-

Good passive transfer does not always prevent infection either,
so be alert.



*Dystocia= risk for FPT
Foal had one leg back and had to be pulled; up w/in 15 min,
Nursing in < 30 min; IgG - ??
Owner declined testing*



Even foals who nurse well get sick.

This foal had a normal birth, nursed normally, sick by ≈ 4-5 days of age

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Pearls:

Causes of FPT

Mare factors

- Inadequate quantity or poor quality colostrum
 - Prelactation
 - Placentitis
 - Fescue ingestion in late gestation
 - Concentrating defect
 - Older mares > 15 yrs
 - Poor condition of mare
 - Malnutrition
 - Systemic illness
- Inadequate access to udder
 - Rejects foal – more often in maiden mares
 - Poor mothering instinct - doesn't allow foal enough access

Foal factors

- Failure to ingest sufficient quantity
 - Weakness at birth
 - Prematurity/dysmaturity
 - Angular limb deformities
 - Injury at birth
 - Any illness – colic, meconium impaction, sepsis, etc
 - Colder climates, lack of sun
 - Prolonged gestation
 - Fescue ingestion by mare in late gestation
 - Dystocia
- Failure to absorb adequate immunoglobulin from colostrums
 - Malabsorption - Stress, GI disease
- Illness - ↑ metabolism and catabolism of IgG's in spite of adequate ingestion/absorption

A note about colostrum substitutes

- IV and oral commercial IgG products (NOT plasma)
 - Foals with severe FPT need much more than the label doses.
 - So, cost savings of using oral/IV IgG is lost compared to plasma.
 - Probably most useful in foals with partial FPT, that are NOT sick.
- Use IV plasma in really sick foals.



Foal normal at birth but a bit quiet from 12-24 hrs, not nursing well – had a meconium impaction – Rx'd fluids, enema(s), ABs. Did well;

Note the ribs are still prominent at 4d of age – didn't eat as well as he should have early on.

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Colostrum = Mother Nature's Wonder Elixir* (adapted from Dr. J. Palmer)

Provides passive immunity via IgG – traditional thought

Now know – much more complex role:

Contains protective factors and trophic substances:

- ★ Establish healthy barrier in GIT betw luminal bacteria + mucosa
- ★ Target potential pathogens
 - Antimicrobial activity
 - Disrupt, inactivate, bind pathogens; inhibit attachment
- ★ Proper development of GIT epithelium
 - Epidermal growth factor, erythropoietin
 - Anti-inflammatory Anti-inflammatory mediators

Refs: Merck Veterinary Manual 10th ed online, Large Animal Internal Medicine, B. Smith pp. 1592-1594, Blackwell's 5 Minute Consult: Equine 2nd ed., pp. 308-9, 698-9, Vet Clinics of NA, Equine, August 2005, pp 249-53, 273-93. Images courtesy Dr. JG Adams.

My Notes: