Diarrhea in the Horse: 
*Salmonella* and Other Infections

Amanda M. House, DVM, DACVIM  
Assistant Professor  
Large Animal Clinical Sciences  
UF College of Veterinary Medicine

### Introduction
- Colitis (inflammation of the colon) affects thousands of horses across the US each year
- Prognosis varies
- Routine isolation of all horses with diarrhea
- Diagnosis may take days several days... to never

### Clinical Signs
- Depression
- Fever
- Endotoxemia – bright red gums, toxic line
- Hypermotile intestinal sounds
- High heart rate
- Dehydration
- +/- Diarrhea

### Equine Diarrhea
- Introduction
- Clinical Signs
- Diagnosis:
  - Salmonella
  - Clostridium
  - Potomac Horse Fever
  - Parasites
  - Sand
  - Treatment

### Character of Diarrhea
- CLINICAL SIGNS
- COLITIS可愛れ日 sharp 感
- FEVER
- ENDOTOXEMIA
- HYPERMOTILE
- DEHYDRATION
Not helpful for Diagnosis

General Diagnostics
- CBC
  - White blood cell count
- Serum Chemistry
  - Protein level
  - Electrolyte derangements
  - Acidosis

General Diagnostics
- Abdominocentesis – also called a “belly tap”
- Rectal Exam

Additional Diagnostics
- Ultrasonography
- X-rays
- Fecal samples

Ultrasonography

Causes of Diarrhea
- Idiopathic
- Salmonella
- Clostridium
- Potomac Horse Fever
- Small strongyles
- Sand Enteropathy
- Right Dorsal Colitis
- Antibiotic Induced
Salmonella

- Gram negative facultative anaerobes
- Group B, including S typhimurium and S agona, frequently associated with disease
- One of the most common diarrheal diseases in the horse

Salmonella

- Prevalence of fecal shedding in the US is estimated to be 0.8%, and 1.4-20% in horses admitted to veterinary teaching hospitals

- Risk factors for shedding:
  - Antibiotics prior to hospitalization
  - Abdominal Surgery
  - Diarrhea
  - Prolonged hospitalization
  - Laminitis, low wbc count, reflux

Clinical Syndromes

- No clinical signs
- Depression, fever, low wbc count without diarrhea
- Enterocolitis with diarrhea
- Septicemia +/- diarrhea (primarily neonates)

Diagnosis - Salmonella

- Fecal culture of 5 consecutive fecal samples
- PCR of 3 or more consecutive fecal samples
- Intermittent shedding

Clostridium

- Obligate anaerobic to aerotolerant spore-forming gram + rods
- Ubiquitous to environment in spore form
- C difficile and C perfringens (types A and C) are most commonly reported
- Common antibiotic-associated cause of colitis

Clostridium perfringens

- Widely distributed as spores and vegetative cells in the environment
- Clinical signs are more common in foals than adults
- Differentiated based on toxin production
  - Alpha, beta, epsilon, iota, enterotoxin


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Potomac Horse Fever

- Caused by *Neorickettsia risticii*
- Signs include fever, colic, diarrhea, laminitis, and kidney failure
- Diagnosis via blood titers and PCR testing
- NOT widespread in the SE US
- Treatment is with oxytetracycline, supportive care

Small Strongyles - Cyathostomes

- Well-recognized cause of chronic diarrhea, however acute colitis may also be seen
- Eggs shed by mature females develop into infective L3 on pasture and are ingested
- L3 migrate across the intestinal wall and become encysted or develop into L4 and excyst

Diagnosis - Cyathostomes

- Definitive diagnosis is challenging because the disease is caused by larval stages, making fecal egg counts not always helpful
- Larvae in manure or on glove after rectal exam
- McMaster technique for fecal egg counts
- Modified Stoll’s technique – requires centrifugation

Cyathostomiiasis

- Exploratory Celiotomy
Sand Enteropathy

- Present for acute or chronic diarrhea, colic, or weight loss
- May not have any abnormalities on CBC or Serum Chemistry
- Coastal regions of west and southeast over-represented

Diagnosis of Sand
- Auscultation
- Fecal sedimentation
- Abdominal radiographs
- Abdominal ultrasonography

X-Rays

Ultrasonography

Treatment of Diarrhea
Treatment of Diarrhea

- Fluids and supportive care
- Address endotoxemia
- Antimicrobials
- Probiotics
- Targeted therapy

Antibiotics??

- CONTROVERSIAL
- Metronidazole if Clostridial colitis suspected, Oxytetracycline for Potomac Horse Fever
- Profound neutropenia (low wbc count), sepsis, foals

What about Probiotics....

- Minimal evidence-based research supporting use
- Probably not harmful

DTO-smectite

- Biosponge™ (Platinum Performance)
- Binds C difficile toxins A and B, C perfringens enterotoxin, and endotoxin

Specific Therapy

- Small Strongyles
  - Moxidectin or
  - Fenbendazole (10 mg/kg PO daily for 5 days)
- Sand – further discussion by Dr. Sanchez
  - Psyllium mucilloid (1 g/kg via NGT daily)
  - Environmental management

In Summary

- Not all horses with colitis present with diarrhea
- Isolate affected horses
- Fecal culture, PCR and toxin ELISAs may identify infectious etiologies
- Abdominal radiography and ultrasound can be useful tools for diagnosis and prognosis
- Fluid therapy and supportive care remain the cornerstone of therapy
Thank You!!

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Any Questions?

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