ROSSDALES
VETERINARY SURGEONS

Foal diarrhoea

Diarrhoea is a very common clinical condition in foals during the first six months of life. It has a broad range of aetiologies with a corresponding range of prognoses. Clinical signs vary from a transitory change in faecal consistency to critical loss of fluid from the circulation leading to shock and life threatening illness. Some foals with diarrhoea will also show abdominal pain (i.e. colic). Therefore, it is very important to be able to distinguish between cases that can be managed in an ambulatory setting and those requiring hospitalisation and intensive care.

DIAGNOSTIC EVALUATION

The diagnosis may be challenging and should begin with a detailed clinical history and examination of the affected foal. Baseline blood work should include complete blood cell count, inflammatory markers and biochemical profile. Further laboratory tests are dependent on the age of the foal and signs of systemic compromise i.e. venous blood gas analysis, electrolytes, immunoglobulin concentration, blood culture, etc.

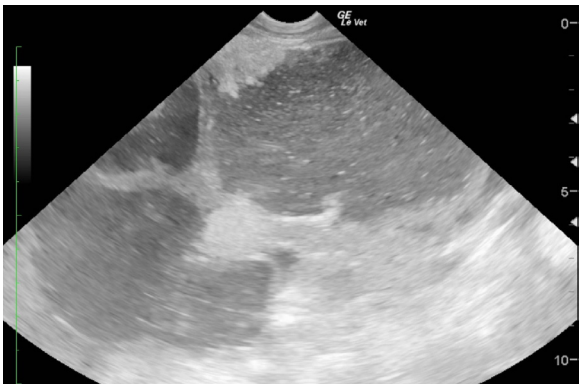

Fig 4: An abdominal ultrasound of a neonatal foal with evidence of inflamed large colon with a large quantity of liquid diarrhoea within the colon. The darker areas represent cross-sections of the fluid filled colon.

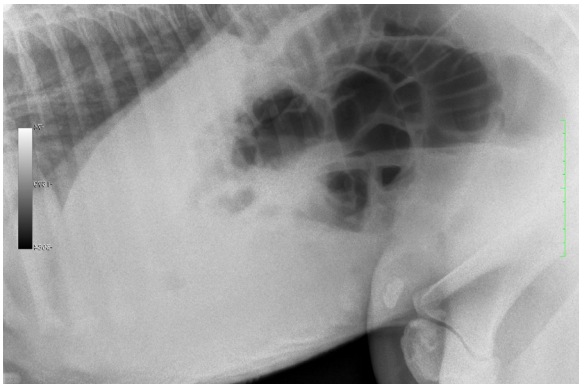

Fig 5: An abdominal radiograph of a neonatal foal with evidence of gas distension of the large colon. The darker areas represent loops of colon containing excessive gas.

Abdominal ultrasonography is a quick and non-invasive technique that allows evaluation of the different organs, intestinal contents, wall thickness and grade of visceral distension. It can also be used to assess internal umbilical remnants and possible sites for collection of abdominal fluid. Other imaging modalities like radiography can be helpful to identify sand and further evaluate intra-abdominal contents.

Identification of the exact cause is not always possible and although it may not dictate treatment for an individual animal it is very important from a biosecurity point of view to try to at least rule out the important infectious causes. There are several complex diagnostic tests and protocols which overall consist in the detection of the virus, parasite, bacteria, and/ or bacterial products in faeces.

TREATMENT

Treatment in many cases of diarrhoea is similar, with supportive care playing a large part in a successful outcome. It is important to treat affected foals promptly, before lesions become advanced and

Fig 1: A familiar sight on stud farms, this 10 day old foal has pasty diarrhoea but is otherwise bright and healthy, typical of foal heat diarrhoea.

Fig 2: A more serious problem: profuse, haemorrhagic diarrhoea in a new born foal.

Fig 3: Foals with inflamed intestine can show diarrhoea and colic.

Causes of diarrhoea in foals : 0–10 days	
Infectious diarrhoea	**Non-infectious diarrhoea**
Viral infections • rotavirus • coronavirus/adenovirus (usually seen in immunocompromised foals) **Bacterial infection** • Gram-positive enterocolitis: *Clostridium spp* • Gram-negative enterocolitis: *E. coli*, *Salmonella spp*, *Actinobacillus spp*, Neorickettsia risticii (USA) **Fungal infection** • Candida/Mucor spp (seen in immunocompromised foals) **Protozoal infection** • *Cryptosporidium spp*	Foal heat diarrhoea- short period of diarrhoea; foals usually remain bright and nurse normally Diarrhoea secondary to meconium impaction Errors of feeding; incorrect volume or frequency, especially in orphaned foals Other infrequent causes of diarrhoea in this age group are congenital lactose intolerance, gastric ulceration, sand enteritis/colitis and perinatal asphyxia syndrome (PAS)

Causes of diarrhoea in foals : 10 DAYS TO 6 WEEKS	
Infectious diarrhoea	**Non-infectious diarrhoea**
Viral infection • rotavirus • coronavirus **Bacterial infection** • Gram-positive enterocolitis: *Rhodococcus equi* (uncommon in foals less than 6 weeks but may occur), *Clostridium spp* • Gram-negative enterocolitis: *E. coli*, *Salmonella spp*, *Actinobacillus spp*, *Campylobacter spp*, Neorickettsia risticii (USA) **Fungal infection** • Candida/Mucor spp (immunocompromised foals); this is the typical age group in which this type of diarrhoea is seen in Severe Combined Immunodeficiency of Arabian foals. **Protozoal infection** • *Cryptosporidium spp* **Parasitic infection** • *Strongyloides westerii*, *Parascaris equorum*, *Strongylus vulgaris*.	Foal heat diarrhoea (normally seen up to 2 weeks of age). Dietary induced diarrhoea: • errors of feeding • post enteritis lactose intolerance • dietary hypersensitivity (rare) • copper deficiency (rare) • sand enteritis/colitis (rare) Antibiotic associated diarrhoea – most commonly seen with orally administered antibiotics but can occur with parenteral administration Gastric ulceration

Causes of diarrhoea in foals : 6 WEEKS TO 6 MONTHS	
Infectious diarrhoea	**Non-infectious diarrhoea**
Viral infection • Rotavirus; coronavirus **Bacterial infection** • Gram-positive enterocolitis: *R. equi*, *Clostridium spp*, *Lawsonia intracellularis* • Gram-negative enterocolitis: *E. coli*, *Salmonella spp*, *Actinobacillus spp*, *Campylobacter spp*, Neorickettsia risticii (USA) **Fungal infection** • Candida/Mucor spp (immunocompromised foals). **Protozoal infection** • *Cryptosporidium spp* **Parasitic infection** • *Strongyloides westerii*, *Parascaris equorum*, *Strongylus vulgaris*.	Dietary induced diarrhoea • errors of feeding • post enteritis lactose intolerance • dietary hypersensitivity (rare) • copper deficiency (rare) • sand enteritis/colitis (rare) Antibiotic associated diarrhoea Gastric ulceration

there is further systemic compromise. Treatment of diarrhoea in neonatal foals or foals with diarrhoea and signs of sepsis (i.e. depression, fever, poor appetite, etc.) generally involves the use of broad-spectrum antimicrobials and anti-ulcer medication. Anti-diarrhoeal drugs and intestinal protectants such as bismuth subsalicylate (Pepto-Bismol®) and intestinal adsorbents (i.e. Bio-Sponge™) are commonly used to help reducing bowel inflammation and prevent toxin absortion. In cases of sand colitis bulk laxatives such as psyllium can be used.Pain-killers may be given to foals with colic signs secondary to bowel inflammation but it is important to avoid the use of nonsteroidal anti-inflammatory drugs in foals with kidney compromise or significant dehydration prior to fluid therapy.

Fluid therapy may be necessary to correct hydration, shock and electrolyte imbalances. When severe shock is developing or there is very low protein, hyperimmune plasma or colloides specific fluids can be used. Hyperimmune plasma provides plasma proteins but also immunoglobulins useful to the neonatal critical foal. Colloids are a specific type of intravenous fluid and these contain large molecules to counteract the protein loss.

DIET

The benefits of allowing the foal to continue to nurse usually overcome the risk that ingesting milk may exacerbate diarrhoea. Foals should continue to nurse providing the clinical signs are mild and there is no evidence of colic, abdominal distension or any aetiology that would benefit from a period of gastrointestinal rest. If the foal is suspected to have some degree of lactose intolerance, supplements with lactase enzyme can be administered. If it is decided that the foal will benefit from a rest from nursing, it will become necessary to provide glucose and other nutrients via intravenous infusions.

PREVENTION AND GENERAL MANAGEMENT

Good management practices are the key to prevention. The mare should be properly vaccinated and foaling environment should be clean and warm. If a newborn foal stops nursing, becomes depressed or has profuse or bloody diarrhoea, a veterinarian should examine it as soon as possible. The foal's rump should be kept clean and a water repellent ointment applied to prevent faecal scalding.

Foals with diarrhoea should be isolated from healthy animals. After resolution of clinical signs foals may continue to shed infectious agents in their faeces and should therefore be handled with care. The length of time the foal must be isolated from others will depend on the causative organism and it is often possible to test whether the foal is still infectious to others.

Biosecurity precautions are incredibly important; care should be taken to wear boots and coveralls, hands should be washed with an appropriate disinfectant hand cleanser and separate equipment should be used for feeding and stable care. Foot dips should be put in place next to the foal's stable and also in the adjacent walkways. The exact disinfectant to be used again depends on the causative organism.

CONCLUSION

In summary, management of foals with diarrhoea depends on the severity of clinical signs. Foals with mild diarrhoea and otherwise healthy often resolve spontaneously or with minimal medical intervention. Foals that are febrile, depressed or have profuse watery or bloody diarrhoea should be examined and treated promptly. Appropriate diagnostic tests, management decisions and medical therapy may be critical in preventing spread of infectious organisms or limiting the severity of illness in affected foals.

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