



CLOSTRIDIUM ENTEROTOXEMIA IN FOALS

Patrick M. McCue

DVM, PhD, Diplomate American College of Theriogenologists

A good client's mare foaled at home without complication just after midnight in early April. The colt stood and nursed, passed meconium and appeared normal and healthy throughout the first day. At 36 hours of age it was noted that the foal was not acting right. A few hours later mild diarrhea started. By 50 hours of age the colt was down and painful. Despite medical therapy, the foal passed away before it was 60 hours old.

The scenario described above was real and has been played out countless times on breeding farms throughout the world. The culprit in this case was a bacterial organism called *Clostridium perfringens*.

Clostridium perfringens Types A and C have the potential to cause a medical condition called enterocolitis in neonatal foals. Enterocolitis refers to inflammation of the small and large intestine. The source of infection for a neonatal foal may be a carrier horse (possibly the mare) shedding the organism in feces or exposure to bacteria in the environment. Examples of environmental exposure include organisms on the udder or body of the mare or organisms in the foaling stall, stable, paddock, water bucket or feeding trough.

Clostridium perfringens Type A is commonly found in the environment of horse farms, whereas Type C is less

commonly isolated. In one study, more than 60% of foals 8 to 12 hours of age and more than 90% of foals 3 days old had *Clostridium perfringens* in their feces. It was noted that *Clostridium perfringens* Type A appears to be a normal inhabitant of the gastrointestinal tract of neonatal foals. It is not known why some foals develop enterocolitis due to *Clostridium perfringens* and other foals do not.

Stock-horse breeds, including Quarter Horses, have the highest risk of development of *Clostridium perfringens* enterocolitis in neonatal foals. Other factors associated with an increased risk include current or historical presence of other species of livestock on the premises, presence of a floor type in the foaling area that is difficult to clean (i.e. dirt, sand or gravel), and high milk production by the mare.

Clinical disease may affect one or two foals on a farm or occur as an outbreak in multiple foals. *Clostridium* is not considered to be contagious from foal to foal.

Clinical signs of *Clostridium* enterotoxemia include severe abdominal pain or colic, foul smelling and sometimes bloody diarrhea, dehydration, depression, abdominal distention and/or rapid death. The organism and associated toxins cause severe damage

to the mucosa and villi lining the small and large intestine.

Affected foals appear healthy at birth and usually have adequate passive transfer of colostral antibodies. The disease typically occurs within the first week of life, is rapidly progressive and associated with a high mortality rate.

Confirmation of a diagnosis of *Clostridium perfringens* infection in foals with enterocolitis is based on anaerobic culture of fecal samples, with further typing of any isolated *Clostridium* bacteria, identification of specific bacterial toxins in feces and other diagnostic tests.

Intensive medical treatment is often necessary to save the life of clinically affected foals. Treatment may include intravenous fluid support, antibiotic therapy, oral administration of *Clostridium perfringens* type C and D antitoxin or plasma, intravenous administration of hyperimmune plasma, administration of a toxin adsorbant and other medications. In severe cases the foal may need to be fed intravenously and milk withheld.

Preventive measures that may be instituted on farms with a history of neonatal infections with *Clostridium perfringens* include vaccination of mares prior to foaling, thorough cleaning and disinfection of stalls between foalings, washing the udder of the mare before the foal suckles for the first time, and prophylactic administration of specific antibiotics for the first few days of life and oral *Clostridium perfringens* Type C and D antitoxin. It may also be beneficial to administer a non-specific intestinal adsorbent (i.e. Bio-Sponge™) beginning at 6 to 12 hours of age.

Unfortunately, there are no vaccines against *Clostridium perfringens* organisms or their toxins labeled and approved for use in the horse. There is some evidence that immune protection for a newborn foal may be gained by vaccination of the mare 6 weeks and again at 3 weeks prior to the due date with a *Clostridium* toxoid vaccine approved for other livestock. This will hopefully induce formation of antibodies against *Clostridium* toxins that will be transferred to the foal through colostrum.

The goals for prevention of clinical disease would be to limit or eliminate potential exposure, prevent colonization of the organisms in the intestinal tract if ingested, and to prevent the bioactivity of toxins produced if organisms are present in the intestinal tract.

Please contact your equine veterinarian for more information on prevention of *Clostridium* enterotoxemia and other diseases of foals.



Foal with bloody diarrhea