

FIELD TREATMENT OF THE SICK NEWBORN FOAL

DR. KEVIN CORLEY
VETERINARY ADVANCES LTD, THE CURRAGH, CO. KILDARE, IRELAND

Sick foals can represent a big challenge in the field as not only can disease progression be very rapid, but also clinical signs are not always obvious. Foals are the weakest members of the herd, of a prey species. This means that they must avoid showing clinical signs of illness for as long as possible. This often makes the vets, nurses and owners jobs much harder, as serious disease can have fairly subtle clinical signs. This is especially true of remaining standing, and it takes very marked disease to take a foal off its feet.

Major diseases in foals and their common presenting signs: Perinatal Asphyxia Syndrome
(previously called Neonatal maladjustment syndrome; Hypoxic ischaemic encephalopathy)

Predisposing factors are dystocia, requiring resuscitation at birth, birth by C-section or premature placental separation. However, many cases occur without any of these predisposing factors being present.

There is a range of clinical signs, and foals may show any or all of them as they progress through the disease. They can occur at birth, or after a delay of typically 18-36 hours. In the mildest forms, there is reduced nursing activity and/or poor affinity for the mare. Incoordination of the suck response and “tongue-lolling” are also very common. General poor coordination and inability to walk can also be seen. The most severely affected foals are unable to rise, with either extensor rigidity or coma. Seizure activity can also occur with perinatal asphyxia syndrome, and is not always accompanied by other severe signs.

Septicaemia

Septicaemia has no specific clinical signs. The foal may be slightly depressed yet still be nursing in the early stages of sepsis. Septicaemia results in changes to the coagulation system and circulation, and signs of these changes may be seen in some affected foals. The main circulatory changes seen are injection of the oral mucous membranes and conjunctiva. Generalised oedema can also sometimes be seen.

Coagulation problems can result in petechiation (small blood spots) inside the ear, and on the mucous membranes and muzzle. Infection can settle out in a number of sites in the foal, and the joints and the umbilicus are the most common. Joint infection can progress to osteomyelitis, or infection can settle in the bone with no obvious synovial involvement.

Prematurity

Foals that are premature often have distinct clinical features: Domed heads, fine silky hair, floppy ears, lax tendons and incomplete ossification of the small tarsal and carpal bones. They may also be dyspnoeic.

Ossification of the small tarsal and carpal bones has great bearing on the future athletic ability of these foals, and foals with little ossification are unlikely to become athletes. Thoroughbred foals less than 25kg are unlikely to survive.

Colic

Almost all foals show colic in the same way, no matter what the cause. They tend to roll onto their backs and stay there for a while, rather than rolling violently like an adult horse. The most common cause of colic in foals less than 36 hours old is a meconium impaction. These usually respond well to a phosphate or soapy water enema, or failing that, an acetylcysteine retention enema. Occasionally the meconium can be higher up the gastrointestinal tract, and therefore will not respond to an enema. It is important to remember, however, that meconium impaction is not the only cause of colic in this age of foal, and never occurs in older foals. Meconium impaction almost never results in gastric reflux, and if the foal is refluxing, small intestinal lesions such as volvulus or intussusception should be suspected.

Enterocolitis

The most common condition we see in foals less than 6 weeks old is enterocolitis. The causes vary with age. In the first week of life, generalised septicaemia is the most common cause. Between 1 and 4 weeks of age, we see a lot of rotavirus. Foals with enterocolitis present with a wet tail, and sometimes faeces down their hind quarters. Often foals with chronic diarrhoea will have hairloss over the hindquarters.

Ruptured bladder

Foals with ruptured bladders usually present at approximately 3-5 days of age with a very swollen abdomen. These foals may also show signs of colic, although despite great abdominal distension, this is not a universal sign.

An important differential for ruptured bladder is dysfunctional bladder syndrome, a single organ manifestation of perinatal asphyxia syndrome. Often no other signs of perinatal asphyxia syndrome are evident. In this condition, the bladder does not empty, and will increase in size until it ruptures. Very large volumes (>1.5L) can be removed by catheterisation. This condition is distinguished from a ruptured bladder by ultrasound examination of the bladder and abdomen. Treatment consists of placing an indwelling urinary catheter for 1-3 days.

Neonatal isoerythrolysis

Neonatal isoerythrolysis occurs when the mare makes antibodies to antigens on the foal's red blood cells because the stallion has a different blood type to the mare. The most common blood groups involved are Aa or Qa.

The most common clinical sign is icterus – yellow discolouration of the mucous membranes. This occurs due to accumulation of bilirubin, which is a breakdown product of haemoglobin in red blood cells. In some cases, there may be dark red staining of the urine.

Emergency treatment of foals

In the field, the most important emergency treatment is fluids. Any neonatal foal that has not nursed for four hours or more is very likely to require fluids. A 50kg foal will require between one and four litres as a bolus as emergency fluids. In the field, Hartmann's solution is the fluid of choice for emergency resuscitation.

Antibiotic choices for foals

Systemic and local bacterial infections are common in neonatal foals, and cause significant mortality and morbidity. Often signs of infection can be quite subtle in neonatal foals, and may be missed by inexperienced owners.

It has been shown in human critical care that early administration of appropriate antimicrobials is critical to survival, and clinical experience suggests that this also holds for neonatal foals. Therefore, both early recognition of infection and choice of antimicrobial can make a significant impact on outcome in foals.

Successful antimicrobial therapy depends on a number of different factors: Early institution of therapy, appropriate dosage and selection of appropriate antimicrobials. The requirement for early institution requires that good “educated guesses” are made about possible causative organisms and their likely antimicrobial sensitivities. Appropriate dosage requires a good knowledge of the antimicrobial, and particularly the differences in dose between neonates and adults. Selection of antimicrobial depends on its spectrum of activity, penetration into the tissue in question and cost per dose.

In studies, the most common bacteria isolated in the blood of septicemic foals were *Escherichia coli* and *Actinobacillus* species. *Streptococcus* and *Enterococcus* are also common. In contrast, the most common blood isolates from foals with diarrhoea were *Enterococcus* species and *Pantoea agglomerans*, with *E. coli* and *Actinobacillus* being isolated much less frequently. Some North American and Australian hospitals and farms have recently experienced high isolation rates of multi-drug resistant bacteria, including Methicillin Resistant *Staphylococcus aureus* (MRSA) and highly resistant *Enterobacter* and *Enterococcus* species. MRSA has also been isolated from horses in Europe, and 10.9% of horses in one European study carried MRSA in their nasal secretions.

There are three reasons why the choice of antimicrobials is different in neonatal foals than in mature horses. The first is that foals are not (yet) hindgut fermenters, and antimicrobials that can cause severe colitis in mature horses do not carry the same risk in foals. Secondly, given that a foal weighs approximately 1/10th of a mature horse, antimicrobials that are cost-prohibitive in mature horses can be used in neonatal foals. Lastly, toxicities may be different for foals than for mature animals.

One of the most important points to remember about antimicrobial treatment in neonatal foals is that, **for many drugs, the dosage is considerably higher than adult horses**. A much higher percentage of the body mass is comprised of water in neonatal foals, as compared to adults. In general the dosage of hydrophilic drugs (such as the aminoglycosides) is higher in foals, whereas the dosage is the same as adults for lipophilic drugs.