



Diarrhea in Young Foals

BY HEATHER SMITH THOMAS

INTESTINAL INFECTIONS CAN BE DEADLY for young foals, especially in the first days and weeks of life. A clean environment, good care and monitoring, and being proactive to head off or deal with any problems are very important.

Dr. Ernest H. Martinez II, of the Haggard Equine Medical Institute in Lexington, says newborn foals (first 24 hours through the first week of life) are most at risk so it is crucial to deal with any diarrhea at this age quickly and aggressively, preferably by experienced personnel or a veterinarian.

“Those foals can get really sick very fast,” he said. “They dehydrate quickly, and their electrolytes can get out of balance. Damage to the GI (gastrointestinal) tract from an infection can cause

a bacteremia (bacteria in the bloodstream) or septicemia, which can quickly be fatal.”

These young foals have a naïve immune system, and the infection might end up in the joints, with more complications later.

SIGNS OF SICKNESS

The foal will be dull, lying around more than usual, and off feed. Often the first clue will be the mare with a full udder or streaming milk.

“At this young age these foals can go downhill very quickly,” Martinez said.

Thus, it is important to identify a problem quickly.

Dr. Eric Schroeder, assistant professor-Equine Clinical Track, Department of Veterinary Clinical Sciences at the Ohio State University, says the foal may seem just a little lethargic and uncomfortable, maybe rolling onto its back and acting a little colicky. If the mare has a full udder and appears worried about the foal—nudging it and wanting it to suckle—something is wrong.

“A good farm manager picks up on these subtleties very fast,” he said.

A young foal with diarrhea can dehydrate rapidly.

“The young foal consumes about 20% of its body weight daily in milk, nurses often, and urinates frequently. If the foal is not nursing as much as usual and continually losing fluid through diarrhea and urine, the end result is dehydration,” Schroeder said. “If there is any wetness on the foal’s tail, even if you are not seeing diarrhea, this is a sign of trouble.”

You don’t always see the foal passing loose feces, or see the watery feces on the ground; it might soak into the grass or bedding. Often the foal’s wet tail or buttocks may be the only clue.

INFECTIOUS CAUSES

Bacterial pathogens include *E. coli* (*Escherichia coli*), *Salmonella*, *Clostridium perfringens*, and *C. difficile* (*Clostridium difficile*). The most common virus is rotavirus.

“Most breeding farms vaccinate pregnant mares for rotavirus in the eighth,



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Young foals have naïve immune systems, which can lead to all sorts of complications

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ninth, and 10th months of pregnancy to help boost the antibodies in the colostrum,” Martinez said.

“Rotavirus can be a significant problem on large breeding farms, due to extensive animal traffic and can be endemic in the environment,” Schroeder said. “Rotavirus can cause classic diarrhea outbreaks. It can be a challenge because this virus is aerosolized. It can be spread not just by the fecal-oral route but also through the air, potentially exposing all the foals. Older foals can act as a reservoir population and infect younger foals.”

Dr. Bonnie Barr, of Rood & Riddle Equine Hospital in Lexington, says sometimes coronavirus is seen.

“We don’t know yet how much coronavirus actually affects the younger foals,” Barr said. “It might be there (and we discover it with molecular testing such as PCR) and it might play a role, but may not be the key player.”

Cryptosporidium is a protozoal intestinal parasite that can also cause diarrhea in young animals.

“Those cases are possibly a bit immunocompromised; a strong, healthy foal might not become infected as easily,” Barr said.

“There are some other random, rare pathogens you might see if you are doing a diagnostic fecal panel on a sick neonate,” Martinez said. “If a farm has a big outbreak, the veterinarian might do tests to try to pinpoint the cause.”

An accurate diagnosis can be helpful, to make sure the foals are on the right medications to deal with the pathogen.

NON-INFECTIOUS CAUSES

Martinez says some types of diarrhea are not infectious, such as the loose feces people refer to as foal heat diarrhea or milk scours.

“Research has shown that the loose feces at this time are not so much caused by the mare being in heat but because the foal’s GI tract is changing and transitioning its natural flora,” he said. “The diarrhea is not from anything different in the milk but from changes in the gut.



Foals obtain proper bacteria by eating some of the mares’ feces

This is when you might get by with just some probiotic support and sucralfate or anti-diarrhea paste to coat and sooth the gut lining.”

These cases won’t need antibiotics but should be monitored to make sure they don’t get worse. The foal is essentially healthy and keeps nursing the mare. Be prepared to give supportive treatment if necessary, and keep the foal’s messy hind end “greased” to protect the delicate skin from being scalded/burned by the acidic feces.

“A hypoxic insult (lack of oxygen) to the gut can also cause diarrhea,” said Barr. “A hypoxic insult can occur secondary to prolonged dystocia, placental problems as the foal is being born, or the need for resuscitation at birth, and often other body systems are also affected. Treatment for the gut problem includes supportive treatment and giving the gut time to heal and normalize, which might mean withholding milk temporarily (and providing nutrition intravenously).”

An orphan foal on milk replacer might also get diarrhea or indigestion.

“I always tell people that if you have a foal on milk replacer, stick with the same brand and don’t keep changing. If you have to change, make the transition gradually,” Barr said.

DIAGNOSIS

“We can usually do some diagnostic testing to determine the cause, but we can’t just test a fecal sample because that would grow a lot of different pathogens that might not be important,” Schroeder said.

Many different types of clostridia are commonly found in the environment and in the horse’s GI tract, and their presence in a fecal sample might not mean anything. Testing for specific toxins can be helpful, however.

Diagnosis is often challenging in the sick foal and requires time for results. This creates a debate regarding withholding therapy to test the foal first (having to wait for the results) and more debate in terms of the best test and test media to use.

“Proper fecal sample collection and handling instructions can usually be obtained from the submission laboratory,” said Schroeder.

It is important to figure out why the foal is sick—not only for this particular foal but also to know whether it is contagious to other foals and to people.

“It can be catastrophic if one foal with diarrhea serves as a possible source of infection for the others,” Schroeder said.

For diagnosis, everything starts with the basics—a physical examination of the foal and the mare and a thorough medical history.

“We want to know what’s going on in the environment, whether the mare was sick prior to foaling, travel history, whether other foals in the barn or on the farm have been sick, etc.,” he said. “There can be many complicating factors that provide significant information to guide our handling and treatment of the sick foal.”

TREATMENT

Because of the risk for septicemia with an infectious diarrhea, it’s crucial to start a sick foal on broad-spectrum antibiotics (gram-positive and gram-negative) and also metronidazole to deal with anaerobic bacteria such as *Clostridia*.



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“Many of these antibiotics are administered IV, but some may be oral,” Martinez said. “We try to identify the pathogen and do a sensitivity test to make sure we are using the right antibiotics, but we generally start by leaning a little toward the gram-negative side of the spectrum. The typical IV antibiotics might be Naxcel and amikacin, or ampicillin and amikacin, etc. We try to use antibiotics judiciously and reserve some of them for use in the hospital.

“If it’s a virus, there’s not much we can do to treat it, other than supportive care,” he explained. “The broad-spectrum antibiotics are given to head off secondary invaders and protect against bacterial translocation through the gut wall.”

Barr always puts very young foals on antibiotics.

“This is not necessarily to treat the primary cause (since it might not be bacterial), but as prophylactic treatment to prevent a secondary bacterial infection,” she said. “Young foals are prone to bacteremia (bacteria from the gut getting into the bloodstream) and the infection might settle in a joint. The foal might get over the diarrhea just fine, but then has permanent crippling from the joint infection.”

Judicious use of antibiotics can help prevent this sequel.

Schroeder said: “If a physical exam of the foal shows any abnormalities such as mucous membranes not a normal

healthy pink color, abnormalities on auscultation of heart, lungs, and/or abdomen, and presence of diarrhea, the foal will likely be started on antibiotics just because we don’t want to miss the possibility of septicemia. The consequences can be so catastrophic that it’s not worth taking a chance.

“There are minimal risks of antimicrobial administration to the foal,” he continued. “Most commonly these foals would be given some form of oral, intramuscular, or intravenous broad-spectrum antimicrobial. Often metronidazole is added as well for treatment of potential anaerobic bacteria.”

Fluid therapy is crucial to keep the foal from becoming too dehydrated. Barr says the key in treating these foals is maintaining hydration and electrolyte balance, and making sure they are getting nutritional support—especially if they are not nursing.

“In some instances the foal is too compromised to nurse, or bloated and not nursing,” she said. “In these cases you have to provide intravenous nutrition. This can be more difficult to do on the farm than here in the clinic.”

“If the foal has a fever we can use anti-inflammatory/anti-fever medications such as Banamine, Ketophen, Dipyrone, or Equioxx, but we must use these carefully in young foals; we don’t want to cause gastric ulcers,” Martinez said.

The medication might help bring the fever down, and the foal might start feeling better, with more interest in suckling.

“This can be good and bad; you have to make sure the compromised GI tract has good motility and can handle the milk,” said Martinez. “Sometimes you are better off to muzzle the foal, milk out the mare, and put the foal on IV fluids with a little dextrose, and let the gut lining start to heal. Sometimes NPO (nil per os, which means nothing by mouth) is needed, for GI rest. This helps everything move out, rather than having food irritate the damaged gut lining, taking longer to heal.

“Then when you take the muzzle off and let the foal nurse again, make sure the foal doesn’t nurse too much at once and gorge himself,” he continued. “He might not be able to go back to nursing full time; you might want to let him suckle for only two minutes every hour to see how he handles it. You don’t want the foal to get colicky and uncomfortable. A sick foal, with an inflamed GI tract, needs supervised, monitored nursing or he might colic.”

You want to make a gradual transition, and if the foal can’t tolerate milk, he might need to be muzzled again for a while and fed intravenously a little longer while the GI tract heals, and then slowly reintroduce milk again.

“Another simple treatment if the foal is not nursing or has a little diarrhea is to put him on lactaid, which you can buy at the grocery store,” said Martinez. “The lactase helps break down the milk sugars and make them easier to digest.”

Anti-diarrheal medications are also used, and these include binders or pastes to help slow and firm up the diarrhea.

“These include Pepto-Bismol, various types of binding clays like our Relieve Paste, also known as Hagyard diarrhea paste,

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and other anti-diarrheal compounds that bind toxins and hopefully firm up the feces," Martinez said.

Anti-diarrheal products such as Bio-Sponge, Kaopectate, or charcoal products might soothe and coat the gut lining and firm up the gut contents.

The foal should also receive anti-ulcer therapy.

"Some of these medications include Sucralfate, GastroGard, ranitidine tablets, and other proton-pump inhibitors or things that coat the mucosa of the stomach," Martinez said. "The main sign of ulcers in foals is grinding of the teeth, which signals discomfort. You want to be proactive if the foal might have ulcers because you don't want them to get worse, to the point of perforation."

Sick foals are at risk for ulcers because they are not feeling well and their GI tract might not be functioning normally due to the diarrhea.

"The foal nurses and gorges and then doesn't feel good and is stressed and might have a fever because of bacteria crossing over through the gut lining, and it's a vicious cycle that can set him up for ulcers," said Martinez. "Choose

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Probiotics are often given to sick foals.

“This might be as simple as using plain vanilla yogurt containing lactobacillus, which you can get at the grocery store, or some of the probiotics on the market,” Martinez said.

“Use of probiotics and prebiotics is a big trend in both human and veterinary medicine,” said Barr. “There are many different brands available. We don’t know if they truly help, but I think they do help a little bit in the younger foals. Research in this area is ongoing.

“In some instances we may give a foal a transfer of ‘gut bugs’ from mama’s manure or from some other healthy adult horse. At our practice we call this a fecal cocktail, mixing it with a little water and administering it into the stomach by tube. This is sometimes done with foals that have chronic diarrhea because we suspect that the gut flora are very abnormal.”

Foals obtain the proper bacteria by eating some of the mare’s feces, but a sick foal might need more of these.

“If you are trying to treat the foal on your own and he’s not on IV fluids, keep an eye on the acid/base balance on your bloodwork,” Martinez said. “If the electrolytes are out of whack, you can supplement with oral electrolytes in the form of baking soda and lite salt. We usually just mix each one of those by itself in a separate syringe and give those to the foal 10-15 minutes apart. If you mix them together in a syringe, they create a ‘volcano’ effect and can make quite a mess.”

If the foal is on IV fluids, he can be given nutrients and the necessary electrolytes to replace what’s being lost through diarrhea.

“You need to be monitoring bloodwork, white cell counts, and electrolytes,” Martinez said. “These should be checked daily or at least every other day. If the foal is too sick and not respond-

ing within 24-48 hours, you might need a second opinion regarding cause and treatment (you might not be on the right track), or need to get the foal to a hospital for more intensive care.”

It can be labor-intensive trying to care for these foals on the farm.

“A lot of this care is twice a day and with a really sick foal you’ll be administering fluids four times a day, every six hours,” Martinez said. “Antibiotics will be given once or twice a day. Oral meds such as Pepto-Bismol or diarrhea paste can be given up to four times a day. Probiotics should be given as often as possible. If you are in and out of your bio-hazard suit (to go into the stall), this takes a lot of time each day.”

The time commitment and intensive care might be better dealt with in the hospital.

“This gives you more time to care for the rest of the herd or prepare for the next newborn and keep monitoring the rest of the foals to make sure none of them are getting sick. It all depends on what you are set up for and what your farm is capable of,” Martinez said.

You also have to consider the mare.

“She might not be getting enough turn-out because the foal is stuck in a stall,” he continued. “She may have some uterine clearance issues right after foaling, so it can be a lot of work. If the foal isn’t nursing, you’ll also have to keep milking her out until you get the foal back on the udder.”

For an older foal (seven- to 10-days-old or older), you can usually care for a sick one on the farm.

“These foals are usually not as critical as the ones that get sick in the first 24 to 48 hours,” Martinez said. “With those young ones you need to be aggressive, and they might be better off in a hospital environment.”

With any case of diarrhea, infectious or non-infectious, the foal will have a wet tail and messy hindquarters, which can “scald” the skin and ultimately lead to hair loss. It’s important to protect the delicate skin.

“You can use petroleum jelly, mineral

oil, or a product called ‘Shiny Hiney’ that can be sprayed on,” Martinez said. “These provide a coating to keep feces from sticking to the skin, preventing the burning irritation and subsequent bare foal butt.”

PREVENTION

On most breeding farms, new foals are evaluated by a veterinarian within the first 24 hours of life, pulling blood and checking the IgG (Immunoglobulin G) and making sure there was good transfer of antibodies from colostrum to the foal.

“If not, we can give the foal IV plasma to help boost those antibodies to more protective levels, to give that foal a good start,” Martinez said.

It is important to make sure the foal has an adequate amount of high-quality colostrum within the first hours of life.

“You can test the colostrum with a refractometer to make sure it has a high specific gravity,” Martinez said. “The old-fashioned test was just to put some on the back of your hand to see how thick it is and how quickly it dries.”

If it’s really thick and sticky, it’s much better than if it’s thin and watery. Thin, white, milky colostrum contains fewer antibodies.

“On some farms, because of the value of the foals, all foals are prophylactically given hyper-immune plasma,” he said. “While *Rhodococcus* is typically the main target when administering plasma, there is added benefit from the IgG boost. On farms that are able to afford to give plasma to all their newborn foals, we tend to see healthier foals and less incidence of diarrhea. It’s not a guarantee; there might still be some outbreaks, but overall those foals tend to be healthier during their first 30-35 days of life. After that, the maternal antibodies start to drop and there might be some other problems later, but these foals are fairly well protected during the first few weeks.”

BIOSECURITY

If a foal has a problem, it’s important to identify it quickly and isolate that foal.

Biosecurity is imperative to keep an infectious diarrhea from spreading to other young foals on the farm.

“If it’s the beginning of the foaling season, you don’t want it to be spread through your barn and foaling stalls, so it’s crucial to be strict with biosecurity,” said Martinez. “This should include separate handlers for the sick foal and separate utensils/equipment for that stall.

“You want separate leads, separate water buckets, etc. You might also want to cordon off that end of the barn so you can isolate that foal or foals. If you have the space, you can move them to a different barn or simply keep them at one end of your barn, and the healthy ones at the other.

“You can skip a stall and not put any other horse right next to that one. You don’t want nose-to-nose contact. If there’s only a half-wall between stalls and the rest is bars, cover or wall off those bars

to minimize direct contact or aerosolized fecal pathogens that get shed from the sick foal,” he explained.

“Also, be careful how you handle the muck, manure, and old bedding from a sick horse’s stall. A lot of pathogens are shed in feces, and often the fecal-oral route is how the next foal will get the infection. It might be from manure off your boots, your gloves, or your hands when you handle the next foal or help deliver the next foal.”

Foot dips for each stall and in and out of the barn can make sure pathogens aren’t tracked from the sick foal’s stall to other areas of the barn by the people taking care of the foal.

“There are also some disposable biosecurity suits or gowns that can be worn over your clothing,” Martinez said. “These can help thwart the spread of pathogens.”

That stall should be almost like an

intensive care unit in a hospital.

“The stricter you can be about keeping everything isolated to that contaminated sick stall the better,” he said. “There are many disinfectants you can use—to clean aisles and surfaces—and any utensils/tools like pitchforks and brooms that go from stall to stall. Each stall with a sick foal should be like an isolation unit and have its own little kit of thermometers, medicine charts, gloves, disinfectant wipes, etc., and you bio-suit up before you go in. This can add a lot of time and effort to your day caring for that foal, but your goal is to protect the next one down the line.”

Before that stall is used for any other horse, it must be thoroughly cleaned and disinfected. There are many good disinfectant products that can be used. **BH**

Heather Smith Thomas is a freelance writer based in Idaho.



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