CONTRIBUTIONS

Considerations for the Prevention And Management of Equine Colic

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Equine colic continues to be the number one killer of all horses. How can this be? After the many millions of dollars spent on colic research and all of the information available to horse owners through every form of media imaginable, shouldn't equine colic be a disease complex of the past? I'm afraid not. As we examine the risk factors associated with colic it will become very evident why this clandestine killer of horses continues to be an important concern of every horse owner.

Colic means abdominal pain. The pain may be sudden; severe or mild; brief or prolonged. While abdominal pain usually refers to the digestive tract, it may also include pain from the liver, urinary bladder, kidneys, skeletal muscles, or thorax. I have been on several emergency "colic" calls to find a patient trembling and sweating from acute *laminitis (founder)*. The digestive forms of colic occur frequently and may be simple or complex in nature. A thin walled stress sensitive acid producing stomach; 50 feet of twisting and turning small intestine; a thin walled, pendulous, sac-like *cecum*; a freely mobile large colon; a very narrow transverse colon; a narrow and heavily muscled small colon; and a fairly fragile rectum provide ample opportunity for over 100 types of colic to occur with some frequency.

In this article I will review the ***clinical signs associated with colic, what generates colic pain, known causes of colic and colic risk factors, and specific concerns regarding the Friesian horse.***

Signs of Colic

The symptoms associated with colic are numerous and vary with severity. Sweating, pawing, getting up and down, rolling, tail swishing, kicking at the flank, looking at the flank, refusal to eat, depression, grinding teeth, and muscular trembling are all seen at times with different types of colic pain. As you can see from this list of clinical signs, many similar or identical signs appear in other types of painful equine conditions. Heart rates are usually elevated (normal adult heart rates are 30 to 42 beats per minute), respiratory rates are frequently elevated (normally 8-16 breaths per minute), and the temperatures are frequently normal (100 to 101.5 degrees F) except in colics associated with infections or intense inflammatory conditions. The *mucus membranes (gums)* can be a normal pink color, take on a purple-blue hue when toxic, or appear pale when in shock. Abdominal sounds may be increased (*spasmodic colic*) or decreased (*ileus*). Generally speaking, it is better to hear abdominal sounds than to hear nothing.

Mild bouts of colic may resolve on their own and many others respond to medical therapy. This is one reason why colic episodes can be so dangerous. Why? Because in those cases that cannot resolve without more aggressive therapy, valuable time can be lost waiting for a horse to recover from conservative treatment.

Colic Pain

Like our intestines, the equine intestine is infiltrated with nerve endings and pain receptors. Colic pain occurs when there is excessive build-up of intestinal gas, ingested materials, or fluid caused by an obstruction or impaction. Excessive bowel distention inhibits intestinal blood flow and causes *ileus (no bowel motility)*. Because horses cannot vomit, gastric distension can lead to stomach rupture. Any intestinal event that affects blood flow to a section of bowel is very painful. Some examples of painful *ischemic* colic *(loss of blood supply to tissue)* are the following: blood vessel injury or blood clot formation from parasite larval migration; twists of the bowel or its *mesentery (the membrane attaching abdominal organs to the body wall)*, or strangulation of intestine by tumors, particularly *lipomas (benign fatty tumors)*. Intestine that is deprived of blood for 2 ½ to 3 hours or more will experience irreversible damage (cell death). In conditions such as *enteritis* and *colitis (inflammation of the small and large intestines, respectively)* where infectious agents are frequently involved, the release of toxins and inflammatory mediators can trigger pain receptors directly.

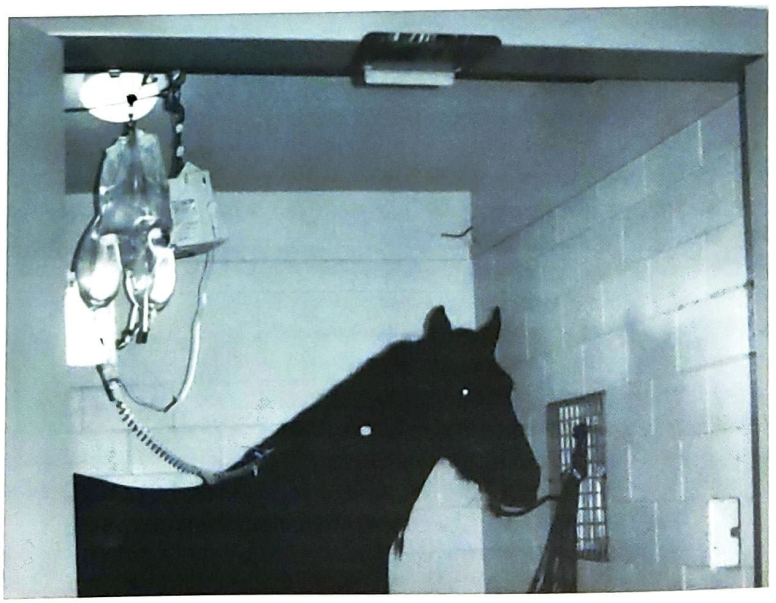
Colic Risk Factors

In the early 1970s through the 1980s colic research focused primarily on the referral colic patient. Some typical research topics included: when to refer a colic to a surgical facility, survival rates of horses with various types of colics, surgical and anesthetic techniques, etc. It wasn't until the 1990s that the risk factor assessment became a research interest. Much like human cardiovascular risk factor research, colic risk factors are being identified. At last some direct take-home information for the horse owners that can help keep their horses out of the operating room!

At first glance the risk factors that are identified seem so overwhelming that you might ask why anyone would want to own a horse. But remember, risk factor analysis can show you ways to stack the odds in your favor against having to experience a late night painful episode of colic. One theme to keep in mind is consistency. Horses like consistency and are more apt to have digestive problems when changes are being made or stresses are introduced. And one more thing, despite all you do and all of the preparation you make to safeguard your horse against colic, it still can happen. The complexities of the equine gastrointestinal tract not only include anatomic challenges, but bacteriologic and physiologic challenges that ensure colic will continue to appear in even the most cared for of horses.

An example of a risk factor is foals. How could foals possibly be a risk factor for colic? They get *meconium (foals' first manure)* impactions in their colons that are a not-so-infrequent cause of colic. Only newborn foals have meconium. By recognizing this, the breeder can take steps to reduce the incidence of seeing a meconium impaction colic by giving the foal an enema. Or, let's say you are a Paint breeder and you want to know if you have any particular colic risks in your breed. A condition called *Aganglionosis* is recognized in Paint horses. This condition essentially has an absence or reduction in the number of nerve endings in parts of the intestine. These nerves control intestinal motility and without them the intestines cannot function properly. This is a specific risk factor for the Paint breed.

What about the ***Friesian*** horse? Are there any specific risk factors that predispose the Friesian to colic? To date I know of no unique type of colic that Friesians are predisposed to. As you continue through this discussion of colic risk factors, give some thought to the colic episodes you have experienced and see if some of the same pieces (or other pieces) of the colic puzzle relate to you.



Aggressive fluid and electrolyte therapy is often needed to resolve a difficult colic

Photo by Bend Equine Medical Center

Breed related risk factors can be important. For example, Standardbred horses, Tennessee Walkers, and Warmblood stallions have a higher incidence of inguinal hernias than other breeds of horses. Small intestine slips through the *inguinal ring (an opening in the groin area for passage of the spermatic cord)* and becomes entrapped next to the testicle. Knowing this, extra precautions also can be taken by the veterinarian at the time of castration.

There are age related risk predispositions to colic. The older the horse is, the more likely it will experience a *colon torsion (a twisting of the colon*), strangulating *lipoma (fatty tumor), cecal* impaction *(cecum is the sac-like initial segment of the large intestine),* or entrapment of intestine in a space called the epipoloic foramen. Lipomas tend to appear more aggressively in the overweight aged horse suggesting that weight management could be helpful here. Many of the age related colics couldn't be prevented by anyone. We do know that dental disease, which can predispose a horse to colic, increases with age and we can easily address this problem
There was a large study undertaken in Texas involving 2,060 horses that developed colic to determine what factors may be present in the environment that could trigger or predispose a horse to colic. The strength of this correlation was assigned a number (odds risk ratios). The higher the number, the more strongly the factor was

Equine Colic, continued

associated with colic. I added the results of another large multi-center risk factor study to the following list. You may find this interesting:

> If a horse had a history of colic in the past 5 years it is 3.63 times more likely to have a future colic episode compared to a horse that had not colicked during that period. A previous colic at any time in the past carries a risk ratio of 3.5. Changing the type of hay more than once a year has a risk ratio of 2.17 (remember the importance of consistency). Give Potomac Horse Fever vaccine- 2.04 risk ratio (you should consider any vaccination as a slight colic risk factor.) Breeding animals were at a slightly higher risk (1.7) than animals used for pleasure. Arabians were at 2.0 risk compared to Thoroughbreds. When non-owners take care of your horse while you are absent the risk of colic increases by 2.2. Access to pasture reduces the risk of colic (0.8). Feed whole grain and increase your risk of colic by 3.4 (whole grain digestion lowers gastric acid ph and ferments into more gas in the colon.) Limited water access in this model took the ratio to 2.2. Recent diet change was 5.0, recent hay change 9.8, previous surgery for colic 4.6, deworming 7 days prior to exam 2.1, and age greater than 10 years 1.5. Concentrate intake at 2.5 to 5 kg gave a risk ratio of 4.77, concentrate fed at greater than 5 kg a day was 6.33. A change in concentrate was 2.17 and a change in concentrate more than once a year was 3.63. ***When a daily dewormer was fed the colic risk ratio dropped to 0.1.***

Other risk factors identified elsewhere include recent transport, the period 60-150 days post-foaling, recent fever, stall confinement, weather changes, and coastal grass hay. You can be sure that there are many more factors that influence colic that have not been examined. What about wood chewing, eating dirt and sand, tree bark, and pine needles to name a few?

Some take home thoughts

A regular program of deworming as recommended by your veterinarian is one of the most essential elements in colic prevention. I am going to make a comment based solely on personal experience regarding dewormers and the Friesian horse. On two separate occasions I have seen diarrhea develop in a significant population of Friesian horses after deworming with oxybendazole (Anthelcide). One case of eneritis was fatal and remained undiagnosed at a University hospital. I am sure the manufacturer would disagree with me, but I cannot recommend using oxybendazole in Friesians at this time.

Now let's say your horse develops colic, here are some tips that may help keep you out of the operating room (or get you to surgery in time to save the horse):

1. Colic is an emergency. It is far better to treat this condition early than wait for a resolution. Post colic complications increase and survival rates decrease when appropriate treatment is delayed.
2. Banamine is a very useful drug for the treatment of colic, but it also is a potent pain reliever that can mask the signs of colic. If you administer Banamine yourself, be sure you are in communication with your veterinarian.
3. One of the most common and serious mistakes horse owners make is to feed their animals too soon after a bout of colic. Sedatives and Banamine make horses feel great. They will eat readily under the influence of these drugs. Owners get a false sense of well being watching their horse eat again. Don't do it. Make sure several hours have passed, manure has been passed, and your horse is not under the influence of drugs before resuming feeding. Your horse will not starve to death.
4. Understand the capabilities of your veterinarian. Be a wise consumer. Nearly all serious colics require aggressive fluid and electrolyte therapy. We still see colic horses at our hospital that have been "treated with everything possible". This may include only 5 or 10 liters of fluids whereas it is not uncommon for us to resolve a difficult medical colic after 200-300 liters of fluids. If your horse's colic has not resolved after the first treatment, have some idea about what you might do if the colic does not resolve soon and discuss your feelings with your veterinarian.
5. If there is a reasonable likelihood that a colic horse may require aggressive fluid therapy or surgery, do **not delay** in transporting the horse to a qualified equine hospital. I have been involved in treating colic or performing surgery in many hundreds of colic cases and know from personal experience that far too many horses arrive at the hospital too late.