UF IFAS Extension UNIVERSITY of FLORIDA

VM177

https://doi.org/10.32473/edis-vm139-2009

Colic in Horses[1]

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Introduction

Colic is one of the most common equine health emergencies, and is a leading cause of death in horses worldwide. While the vast majority of colic episodes are mild and resolve with medical treatment alone, some types of colic require surgical intervention for a successful outcome. Although most horse owners hope they never encounter colic in their horses, understanding what colic is and adopting strategies for its management and prevention are an important part of responsible horse ownership and management. A national study conducted by the USDA's National Animal Health Monitoring System in 2015 determined that colic was the leading cause of death for horses aged 1 to 20 years old, accounting for 31.2% of deaths. For horses over 20 years of age, colic was the second leading cause of death (13.4%) behind old age (26.6%). A similar report in 2001 found that the incidence of colic was 4.2 events for every 100 horses per year, that 1.2% of colic cases will require surgery and that 11% will be fatal. This article reviews the most common causes of colic in horses and provides information for horse owners regarding prevention and treatment strategies.

What is Colic?

Colic is a clinical sign of disease but is not actually a disease itself. Colic is defined as '*any abdominal pain*' and can come from any abdominal organ, not just the gastrointestinal tract. Abdominal discomfort from liver or kidney disease will sometimes cause signs of colic. The signs of colic can vary from mild to severe. Mild, early signs of colic can include a poor appetite, decreased manure production, lip curling, depression, or laying down more than normal. The most common signs associated with colic include pawing, stretching out, flank watching, teeth grinding, bloated abdomen, kicking at the abdomen, rolling, and getting up and down. Owners and care takers should know what is normal for their horses, so that abnormal behaviors can be recognized as soon as possible.

Normal behaviors, appetite, and physical exam parameters can vary slightly from horse to horse. In general, **adult horses should have a normal rectal temperature of 99°F -101.0°F, a heart rate of 24-48 beats per minute, and a respiratory rate of 10-24 breaths per minute**. The gums should be pink and moist with a capillary refill time of less than 2 seconds. Most horses will pass 6-10 piles of well-formed manure in 24 hours. Horse owners and managers should routinely use thermometers and stethoscopes to evaluate the normal physical exam parameters for their horses.

Causes of Colic

Many different disorders of the intestinal tract or other organs can cause colic. The focus of this guide will be on intestinal causes of colic. The average horse has over 100 feet of intestine from their mouth to their rectum, and problems with any section can potentially lead to signs of colic. The definitive cause of an episode of colic is not always determined, especially for mild cases that resolve on the farm.

1. This document is VM177, one of a series of the College of Veterinary Medicine, Large Animal Clinical Sciences, UF/IFAS Extension. Original publication date July 2009. Revised June 2016, June 2019, and February 2023. Visit the EDIS website at https://edis.ifas.ufl.edu for the currently supported version of this publication.

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Causes of colic can be divided into three general areas: intestinal dysfunction, intestinal accidents, and inflammation or ulceration of the intestine. The most common types of colic are intestinal dysfunctions; which include gas colic, spasmodic colic, and impaction colic. Gas colic typically occurs due to gas build up in the large colon or cecum. Gas stretches the intestine and causes pain. Spasmodic colic results from increased contractions, or spasms, in the wall of the intestine. Fortunately, both gas and spasmodic colic can typically be treated medically and usually respond to treatment on the farm. Impaction colic is caused by a firm mass of digested feed material which causes a blockage in the intestine. Horses that don't drink enough water and get dehydrated during times of high ambient heat, travel, stress, or physical exertion are at increased risk of developing impaction colic. Other common risk factors for intestinal impactions include poor quality hay, ingesting excessive sand, and any dental problem that prevents a horse from properly chewing feed.

Intestinal "accidents" refer to large colon displacements, torsions (twisted intestine), and strangulations that occur in the abdomen. These causes of colic are referred to as intestinal accidents because they are considered just that – accidents. There is no specific way to prevent intestinal accidents from occurring. For example, colon displacements occur when a portion of the intestine, usually the large colon, moves to an abnormal position in the abdomen. Although sometimes intravenous fluids, strict fasting, and/or other medical treatments can help resolve displacements, many require surgical correction. A twist in the intestine or a strangulation of any portion of the intestine will also require surgery for resolution of the problem. Surgical causes of colic often begin with mild signs and then escalate rapidly, so it is critical to involve your veterinarian as soon as your horse exhibits any signs of colic.

The last broad category of diseases that cause colic are the inflammatory or ulcerative diseases. This category includes problems like enteritis (inflammation of the small intestine), colitis (inflammation of the colon, and usually diarrhea), and gastric (stomach) ulcers. Inflammation of the intestine can be very painful for the horse and cause serious systemic side effects like dehydration and endotoxemia (a systemic inflammatory response to bacteria in the bloodstream). The inflammatory diseases (enteritis and colitis) can sometimes be difficult to differentiate from surgical problems, although they typically do not require surgery. Rectal temperature, mucous membrane color, analysis of a fluid sample from the abdominal cavity, and bloodwork can often help veterinarians determine if an inflammatory condition is present.

Gastric Ulcers

Gastric ulcers are a common cause of intermittent mild colic in performance horses. The prevalence of gastric ulceration in Thoroughbreds in race training varies from 70 to 94%, and most sport horses are similarly affected. The horse's stomach contains two different types of lining – the squamous mucosa on the top half and the glandular mucosa on the bottom. Ulcers can happen in either location but are much more common in the squamous portion. The squamous mucosa of the stomach is essentially similar to the lining of the esophagus, and the glandular mucosa contains the acid-producing cells. Most equine gastric ulcers affect the squamous mucosa. However, because ulcers can affect various portions of the stomach, causing a variety of clinical signs, the umbrella term Equine Gastric Ulcer Syndrome (EGUS) has been proposed to describe the syndrome. Excess acid exposure is the predominant mechanism responsible for squamous mucosal ulceration, while the underlying cause of glandular ulcers remains unknown.

Clinical signs caused by gastric ulcers are generally more mild than other types of colic, and may include anorexia (not eating), weight loss, changes in attitude, and chronic or intermittent colic of varying severity. Many horses with endoscopic evidence of disease may appear to be clinically normal or have vague signs that include decreased consumption of grains, episodes of colic after eating, poor performance or failure to train up to expectations, poor quality haircoat, and decreased condition or failure to thrive. Diarrhea is not typically associated with gastric ulceration in adult horses.

Although a diagnosis of ulcers can be suspected based upon clinical signs and response to treatment, the only current method of confirmation is via gastroscopy. This procedure looks into the stomach with a small camera and can easily be performed on a standing horse with mild sedation after a 12-18 hour fast. The principal therapeutic option for squamous ulcers is treatment with the proton pump inhibitor (PPI) omeprazole. For severe ulcers, additional treatment with the mucosal adherent sucralfate may be prescribed. Omeprazole is the only agent approved by the FDA for the treatment of equine gastric ulcer syndrome (GastroGard®, Merial, Ltd.). After initial treatment (28 days), a lower daily dose has been shown to decrease or prevent the recurrence of disease in animals maintained in training, and is the basis for another FDA-approved form of omeprazole, UlcerGard® (Merial, Ltd.). It is very important to note that

powdered or compounded forms of omeprazole rapidly degrade in the acidic stomach environment, thus the efficacy of these non-FDA-approved medications is highly variable and will very often not improve ulcer healing. For glandular ulcers, treatment with the prostaglandin agonist misoprostol has been shown to improve ulcer healing when compared to omeprazole and sucralfate.

Treatment of Colic

Your veterinarian should be informed as soon as your horse begins exhibiting signs of colic. Treatment with pain relieving drugs such as Banamine® (flunixin meglumine) or bute should only be done under your veterinarian's direction. Obtaining a temperature, heart rate, respiratory rate, and looking at the gums can provide valuable information to your veterinarian about your horse's systemic status.

Veterinary evaluation typically involves taking a complete history of the episode and previous health of the horse, performing a physical examination, rectal examination, and passing a nasogastric tube. Your veterinarian may want to perform other tests, but typically more advanced diagnostics are done at a referral center. Most referral centers will repeat much of the original exam done by your veterinarian to determine if there are any important changes, and can also do blood work, abdominocentesis (sample of fluid from the abdomen), radiographs (x-rays), ultrasound, and endoscopic examination as deemed appropriate.

Treatment for colic depends on the suspected cause. Pain medication such as Banamine® is typically indicated for initial management. Banamine® usually takes about 30 minutes to take effect, so fast-acting sedatives such as xylazine and detomidine are often administered to help relieve pain while the Banamine® begins working. Buscopan™ is another drug that may be administered by your veterinarian and may help treat spasmodic colic by relieving intestinal spasms. Fluid therapy is typically also administered by an oral or intravenous route, depending on the severity and suspected cause of the colic. Laxatives like mineral oil and Epsom salts are often utilized for impactions and are delivered via nasogastric tube – never rectally. Horses that are exhibiting signs of colic should generally be kept off feed until the suspected cause has resolved. It is important to remember that mild intestinal upsets and colic that require surgery may start out with very similar signs. Persistent pain remains the #1 indicator for exploratory surgery in cases of colic. Fortunately, the prognosis for horses that undergo surgery is better now than it has been in the last 50 years. Most horses will return to their previous level of competition after about a 2-3 month post-surgical rest.

What To Do if Your Horse is Showing Signs of Colic

- Stay calm and call your veterinarian as soon as you notice a problem.
- Remove the feed, but not the water, from the stall.
- Take the horse's heart rate, respiratory rate, and temperature before the vet arrives. Evaluate your horse's gum color and moisture.
- Walking can help prevent injury if your horse is trying to go down and roll, but remember to first consider your safety as well as that of the horse. If the horse is too painful and cannot be safely walked, leave them in the stall until your veterinarian arrives.
- It is important to have the horse's previous medical and diet histories available. Have there been any changes in the horse's routine? Has this happened before? This information will be helpful for the veterinarian evaluating the horse.
- **Do not** give more than one dose of pain medication without consulting your veterinarian.
- **Do not** walk the horse or yourself to exhaustion.
- **Do not** try to pass a nasogastric tube or force feed mineral oil. Mineral oil in the lungs can result in a fatal pneumonia. It is also not advisable to insert a hose or anything rectally into a horse to give an enema.
- Remember that chronic mild signs of colic over several days or longer may also indicate a serious problem and require veterinary evaluation.

Prevention of Colic

Unfortunately, there are not many absolutes when it comes to the complete prevention of colic. However, good management and routine health care can certainly help reduce the incidence of colic in any horse or herd. Establishment of a set routine, regular exercise and/or turnout, and a high-quality forage diet are all important management steps. Any concentrate feed should ideally be divided into two or three feedings, and grain-based feeds should be limited when possible. Horses should have annual dental care, and older horses may need dental evaluations every 6 months. Routine fecal examination and deworming for tapeworms are also critical for good herd health.

How to prevent gastric ulcers in performance horses is a common question posed by horse owners. While no management practices have been shown to completely prevent gastric ulcers in horses, current recommendations

include maximizing turn out and access to pasture, splitting feed into small frequent meals throughout the day, and adding alfalfa or peanut hay to the diet. High-carbohydrate grains and concentrates should be avoided or minimized whenever possible. In horses prone to developing gastric ulcers, preventative treatment with UlcerGard® may be beneficial while traveling or competing.

Additional Resources

AAEP Horse Owner's Information Home Page: https://aaep.org/horse-owners

USDA APHIS. Baseline Reference of Equine Health and Management in the United States. December 2016; http://www.aphis.usda.gov/animal_health/nahms/equine/downloads/equine15/Eq2015_Rept1.pdf

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