How to Manage a Horse with Colic in the Field

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Medical management of colic in the field is initially centered on management of pain, which also becomes of critical importance to the decision to refer and on estimating the prognosis. Other components of medical management include decisions related to nasogastric intubation of laxatives and reasonable recommendations for fluid therapy. Rehydration can be accomplished with nasogastric administration of water (with or without electrolytes), or IV fluids, which can be given in the field, but are more typically reserved for in-hospital use. This presentation is intended to provide important points related to choices of analgesics and other medical therapies so that horses with colic can be optimally treated, while avoiding any delays on a potential decision to refer for advanced medical or surgical care. Author’s address: Department of Clinical Sciences, North Carolina State University, 1060 William Moore Drive, Raleigh, NC 27607; e-mail: Anthony_Blikslager@ncsu.edu. © 2020 AAEP.

1. Introduction
Veterinarians are called on a frequent basis to evaluate horses that have developed colic. In many cases, the colic will have either resolved or require simple medical treatment by the time the veterinarian arrives. One factor that complicates the veterinary approach to colic is the frequent use of analgesics by horse owners and trainers. Although this is often under the direction of a veterinarian, this is not always the case, and can complicate case management. Subsequent to management of pain, other treatments for colic that need to be considered are use of nasogastric administered laxatives or fluids, as well as consideration as to the practicality of IV fluid therapy. The goal of this presentation is to present the rationale for the use of differing treatments available for management of colic.

2. Recognition of Colic
Owners have varying abilities to detect colic in their horses. Some owners only notice when the horse has severe colic, but many notice subtle changes in behavior that are not necessarily clear-cut signs of colic. These behavioral signs of colic are nonetheless important for the veterinarian to consider. As the field of pain management in veterinary medicine has dramatically changed in recent years, so has the veterinarians’ ability to detect pain (Table 1).1 When an owner calls to report that a horse has abnormal behavior, such as showing a lack of interest in feed, there is a reasonable likelihood that they have detected behavioral signs of pain, and the most likely cause of pain is colic. For example, horses with early signs of colic tend to stand toward the back of the stall, lose interest in observing other horses and people at the barn, and often will not finish a meal. At veterinary teaching hospitals, behavioral pain scores have been developed to detect subtle behavioral signs of pain that would typically be missed, and they have become a routine component of the monitoring of horses.2 In addition, a description of an equine “pain face” has provided an
some skill in obtaining an accurate history. There-to admit to administering treatments, necessitating and duration of colic. Owners may be reluctant signalment, treatments given, effect of treatment, colic, consider asking your receptionist to get the To shorten the time needed to examine a horse with 4. Initial Examination interestingly, this medication has recently become ameliorate pain in horses requiring surgery. In-

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tinues to be problematic, particularly when it delays owner or trainer administration of analgesics con-
mance of ileal impaction associated with coastal Ber-

muda hay.

On physical examination, the veterinarian can make a more accurate determination of the level of colic (mild, moderate, or severe). This may require having the horse in its normal environment such as a stall or paddock so the behavior is not inhibited by being handled. The next step is to assess the cardiovascular status of the horse. This is done by assessing the color of the gums, obtaining a capillary refill time, and taking the heart rate. It is preferable to take the pulse from the facial artery so that an assessment of pulse quality (“thready” or strong) can be made. However, the horse sometimes makes this difficult because it is in pain; at which time auscultation of the chest is appropriate. If the horse is severely painful, obtaining the heart rate is important if possible because it has consistently been shown to be the best prognostic indicator.5

5. Initial Treatment of Pain
If a horse is actively showing signs of colic, and once the cardiovascular status has been obtained, this is the time to treat for pain. The author’s choice is xylazine (0.3 mg/kg; 150–200 mg) because it is short-acting (approximately 40 minutes), highly effective as an analgesic, and sedates the horse to facilitate the remainder of the examination.6 A popular and effective addition to xylazine is butorphanol (5 mg, IV). If the veterinarian chooses to

Table 1. A Pain Scoring System Adapted to Detect Behavioral Signs of Pain That Can Be Used to Recognize Subtle Cases of Colic That May Initially Appear Normal. Behavioral Pain Scoring System

<table>
<thead>
<tr>
<th>Behavior Category</th>
<th>Behavioral Score to be Assigned for Each Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Gross pain</td>
<td>None</td>
</tr>
<tr>
<td>Head position</td>
<td>Above withers</td>
</tr>
<tr>
<td>Ear position</td>
<td>Forward, frequent movement</td>
</tr>
<tr>
<td>Location</td>
<td>At door watching environment</td>
</tr>
<tr>
<td>Spontaneous locomotion</td>
<td>Moves freely</td>
</tr>
<tr>
<td>Response to another horse</td>
<td>Ears forward, head up, moves to door</td>
</tr>
<tr>
<td>Response to open door</td>
<td>Moves to door</td>
</tr>
<tr>
<td>Response to approach</td>
<td>Moves to observer, ears forward</td>
</tr>
<tr>
<td>Lifting feet</td>
<td>Freely when asked</td>
</tr>
</tbody>
</table>

Scores are added to give a total subjective pain score.
NA, not applicable.

additional level of subtlety when it comes to pain detection. This results from tensing of the musculature along the muzzle and above the eye.3

3. Initial Considerations
Ever since dipyrone was initially taken off the market in 1977, most horse farms have flunixin meglumine readily available and it has become common for trainers to administer non-steroidal anti-inflammatory drugs for colic without consulting the veterinarian. This is not necessarily in compliance with state veterinary practice acts. One approach is to ask the owner or trainer to at least call the practice to let the veterinarian know before treating a horse for colic so that treatment can be discussed. Owners and veterinarians need to be aware that a full dose of flunixin meglumine (1.1 mg/kg, IV) for treatment of colic is a potent analgesic and has duration of 8–12 hours. Use of flunixin meglumine at the currently recommended maximum dosage (1.1 mg/kg, q12h, IV) can make pain in horses that are in true need of intensive care more difficult to detect. This issue of “masking” of colic signs by owner or trainer administration of analgesics continues to be problematic, particularly when it delays further treatment. Dipyrone was successful because it was a mild analgesic and did not completely ameliorate pain in horses requiring surgery. Interestingly, this medication has recently become available on the market again, although it is labeled for treatment of pyrexia.4

4. Initial Examination
To shorten the time needed to examine a horse with colic, consider asking your receptionist to get the signalment, treatments given, effect of treatment, and duration of colic. Owners may be reluctant to admit to administering treatments, necessitating some skill in obtaining an accurate history. Therefore, it is important for the receptionist or the veterinarian to ask questions about administration of medications in a way that makes the owner feel comfortable about providing an accurate answer. Additional history, such as diet, de-worming schedule, and housing can be obtained after the horse has been attended to with some exceptions. For example, it is very helpful to know a horse’s forage diet in the Southeastern United States because of the prevalence of ileal impaction associated with coastal Bermuda hay.

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use flunixin meglumine (0.25–1.1 mg/kg, IV), it has a long duration of action (up to 12 hours), which makes it more difficult to determine if colic is recurrent while conducting a timely visit. Another medication that has become available is hyoscine butylbromide\(^a\) (0.3 mg/kg, slowly IV). This is an excellent anti-spasmodic agent, but the product sold in the United States does not contain an analgesic (this product sold in Europe, also contains dipyrone [metamizole] and is the favored choice for initial treatment for colic in other countries). However, hyoscine butylbromide\(^a\) can be given with non-steroidal anti-inflammatory drugs available in the United States. Concerns on transient elevations in heart rate with hyoscine butylbromide\(^a\) (approximately 20 minutes) become of less concern if the veterinarian has already checked the heart rate and administered an analgesic. If an initial dose of xylazine, particularly if administered with butorphanol, has no effect, the treatment can be repeated. However, it is important to realize that the necessity for a second treatment with an analgesic raises the index of suspicion that a horse needs referral. If pain continues, more potent sedatives such as detomidine (0.01–0.02 mg/kg; 5–10 mg, IV) can be used and can be repeated as needed if the horse remains painful. If repeated doses of detomidine are ineffective, the horse needs to be referred if at all possible. For owners that do not wish to refer, inability to control pain is an important factor in making the decision to euthanize a horse. Alternatively, for horses that respond well to an initial dose of xylazine, following completion of the remainder of the examination, flunixin meglumine (1.1 mg/kg, IV) is helpful as an anti-inflammatory and longer duration analgesic if it has not already been given. If colic does recur, the risk that surgery or intensive care is needed is increased. Therefore, the owner or trainer should be given explicit instructions to keep the horse in a stall, hold the horse off feed, and regularly monitor the horse for 24 hours for recurrence of pain. It is also helpful to ask the owner to assess fecal output. Many horses that arrive at referral hospitals after prolonged durations of colic have been treated on multiple occasions for colic, which can be improved upon if horses with the first recurrence of pain after analgesia are considered for referral. Nonetheless, considerations of expense, owner preference, and shipping are widely understood to complicate decision making.

6. **Remainder of the Physical Examination**

Once the horse is comfortable, the level of dehydration can be determined by tenting the skin on the neck, and looking at the appearance of the eye in the orbit. This can be deceiving in senior horses because of the loss of elasticity of the skin. Nonetheless, most horses can be practically defined as not dehydrated (skin tent, 2–3 seconds), 6% dehydrated (3–6-second skin tent), 8% dehydrated (6–8 second skin tent, some evidence of the eye sinking back into the orbit), or 10% dehydrated (prolonged skin tent, obvious sinking of the eye). The next component of the examination is auscultation of the chest to confirm heart rate (this may be affected by an alpha-2 agonist such as xylazine) and to briefly auscultate the lung fields. Auscultation of the abdomen at the paralumbar fossa as well as at a site on the lower flank for approximately 1 minute on each side is reasonable to classify gut sounds as absent, normal, or increased. Gut sounds may be reduced in response to alpha-2 agonists. The time required for this part of the examination provides a good opportunity to take the rectal temperature, and this should always be done prior to rectal palpation. A febrile horse with signs of colic is often associated with the early phases of enteritis or colitis, and some horses with colitis have severe abdominal pain.

Rectal palpation is a useful and practical means to determine the intestinal segment causing the cause of colic. Determining the position of the spleen is important. If it feels larger than normal, and pushed away from the body wall, the most frequent reason is that the colon is between the spleen and body wall. Phenylephrine (0.01 mg/kg over 20 minutes diluted in saline) and walking or jogging the horse can be helpful to vasoconstrict the spleen to help resolve possible colonic displacement on the left side of the abdomen. Another critical component of the colic examination is nasogastric intubation. When horses have severe pain or tachycardia, the stomach tube should be passed early during the examination to relieve possible gastric distension. Diagnostic ultrasound is becoming a common diagnostic modality and can be adapted to use rapidly in the field using a fast localized abdominal sonography for horses examination. This takes approximately 10 minutes to perform, and can be used to detect such findings as abdominal fluid, distended small intestine, and the appearance of the nephrosplenic space. This is particularly useful in regions of the abdomen beyond the reach of rectal palpation and can be used in conjunction with rectal palpation to provide as much information as possible in terms of localizing the cause of colic.

7. **Laxative Treatment**

Laxatives should be administered via nasogastric tube, and only when there is no evidence of gastric reflux. Additionally, if the veterinarian suspects a small intestinal obstruction, including ileal impaction, nasogastric laxatives or fluids are not indicated because of a lack of transit to the region of the impaction. If a horse is suspected of having a gastric impaction, multiple water lavages of the stomach are warranted. Although mineral oil (2 to 4 L/500 kg PO) is commonly used as a laxative, it has been shown that hydration of the colonic contents can be better achieved by administration of magnesium sulfate (1 g/kg in 4 L of water PO). While sodium sulphate has been shown to result in greater colonic content hydration than magnesium sul-
phate, it also results in thirst and hypocalcemia, making magnesium sulphate preferable. Access to feed should not be permitted but water should be freely available. For impactions that persist, aggressive enteral and/or intravenous fluid therapy should be instituted. One study demonstrated the increased efficacy of continuously administered enteral rehydration solution in softening colonic contents as compared with intravenous fluids, which are probably best suited to restoring the systemic extracellular fluid compartment. In another study, investigators determined that administration of 8–10 L of isotonic enteral fluids every 2 hours in horses with either large colon impaction or large colon displacement successfully resolved impactions in 99% of cases and in excess of 80% of large colon displacements within 24-hours. The enteral fluid was practically simple to make, using 6 g NaCl and 3 g KCl/ L of tap water. In some cases, a less aggressive approach (5 L q 2–4 hours) is helpful to reduce impactions without causing colic or reflux associated with over-filling the stomach. If the impaction remains unresolved, the horse becomes uncontrollably painful, or extensive gas distention of the colon occurs, surgery is indicated.

8. Considerations for Fluid Therapy

Intravenous fluid therapy is typically more practical to reserve for referral hospitals because of the need for frequent monitoring by a knowledgeable technical staff. It is certainly possible to administer fluids in the field, but the time taken to place a catheter and a therapeutic volume of fluids should be carefully considered. Occasionally, catheter placement is also reasonable to enable horse owners to repeat treatment during shipping, particularly for a recurrently painful horse that has a long shipping time. For IV fluid therapy, once the degree of dehydration has been estimated, the percentage is multiplied by the horse’s body weight to give the fluid deficit (e.g., 6% dehydration × 500 kg = 30 L). In the field, if fluids are going to be administered, the veterinarian should be prepared to give approximately 15–20 L, which corresponds to half the fluid deficit for an adult horse that is 6% to 8% dehydrated. This avoids any misconception by the owner that a small volume of fluids will make a difference.

9. Conclusions

Important considerations for optimal treatment of colic in the field are optimal use of available analgesics based on their potency and duration of action, as well as a knowledge of how well the horse can be monitored by the owner. Other considerations are the indicated usages of nasogastric laxatives, and the place of rehydration therapy. Importantly, field analgesia and fluid therapy are effective in the large majority of horses with colic. However, for those horses with breakthrough pain, particularly after potent analgesics including alpha-2 agonists (xylazine and detomidine) and opiates (butorphanol) should be carefully considered for referral. Additionally, management of pain but a lack of success at resolving conditions like large colon impactions over 1–2 days should be also be considered for referral.

Acknowledgments

Declaration of Ethics

The Author has adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest

The Author has no conflicts of interest.

References and Footnote


*Buscopan®, Boehringer Ingelheim Animal Health, Ltd., Duluth, GA 30096.