Right Dorsal Colitis in Horses (16-Dec-2003)

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A. Causes
Right dorsal colitis (RDC) is an enteropathy of horses that has been experimentally and clinically associated with administration of non-steroidal anti-inflammatory drugs (NSAIDs), most commonly phenylbutazone. The pathogenesis of the disease is unknown but is believed to be related principally to inhibition of cyclo-oxygenase (COX) and suppression of intestinal prostaglandin production. The reason that the right dorsal portion of the equine colon is preferentially affected also is unknown. Although the condition can be induced with administration of higher than recommended doses of phenylbutazone, it is important to note that RDC can develop in horses receiving relatively modest doses of phenylbutazone (eg, 2.2 mg/kg q 12 hr) for relatively short periods of time. Although the disease is more commonly associated with oral route of administration, this may simply reflect a higher prevalence of the oral route of administration among horses.

B. Signalment & Anamnesis
Epidemiologic studies documenting predilection for RDC by age, breed, or sex are lacking. Many affected horses are young performance horses. In the author’s experience, ponies are frequently affected. This may be attributable to overdosing phenylbutazone. As mentioned, however, administration of the lower end of the recommended dose range can cause RDC in many breeds of horses. Some horses may be idiosyncratically predisposed.

The medical history of affected horses generally includes non-specific complaints, including inappetance, lethargy, intermittent or episodic colic, diarrhea, and weight-loss; affected horses may have only one of these historical findings. Affected horses generally have a history of NSAID administration. Occasionally, owners or trainers may either forget or be unaware of the history of NSAID administration or may prevaricate because they fear culpability for causing the condition. It can be useful to query owners of horses with clinical and clinicopathological signs of RDC as to whether the horse has history of lameness or other conditions for which NSAID administration might be likely, particularly if NSAID use is not reported. This information also may be important if arthritic horses are predisposed to NSAID enteropathy.

C. Clinical Signs
The clinical signs of RDC are variable. Horses are often lethargic and inappetant. Horses may show signs of colic, and severity of colic signs can vary from mild to severe. Colic signs may or may not be associated with the time of feeding. In some instances, horses will have history of colic but be apparently normal at the time of examination. Affected horses may be tachycardic, tachypneic, and dehydrated, depending on the severity and duration of clinical signs. Horses with RDC often have diarrhea or fecal consistency that is softer than normal. Horses with RDC may have weight-loss; however, weight-loss is correlated with duration of clinical signs and horses that have RDC recognized early may not show signs of weight-loss. Horses with RDC may appear icteric, presumably because of inappetance. Some horses with RDC will have ventral edema associated with decreased vascular oncotic pressure, although this finding is not common. If possible, horses suspected as having RDC should be evaluated endoscopically because clinical signs of RDC can be similar to those associated with gastric ulceration and gastric ulceration can occur concomitantly with, or independent of RDC.

D. Clinical Laboratory Findings
Clinicopathologic testing of horses suspected to have RDC should include a complete blood count, serum biochemistry panel, urinalysis, and peritoneal fluid analysis (PFA). The most consistent clinicopathologic findings in horses with RDC are anemia, hypoproteinemia, hypoalbuminemia, and hypocalcemia. Azotemia may be found in some cases of RDC and in some horses azotemia may be related to NSAID renal toxicosis. These findings are non-specific. Results of PFA are variable
E. Diagnosis
Diagnosis of RDC is clinically challenging because the findings of history, clinical examination, and clinical laboratory testing are non-specific. The differential diagnosis for clinical signs that have been associated with RDC is long, including conditions such as the following: ulceration of the stomach and other portions of the intestinal tract; various causes of colitis including sand enteropathy; cholecithiasis, cholangiohepatitis, and other hepatopathies; inflammatory bowel diseases (e.g., lymphocytic/plasmacytic enteritis); alimentary lymphosarcoma; larval cyathostomiasis; enterolithiasis; muscular hypertrophy of the ileum; and various intestinal obstructive disorders in the case of acute, severe colic associated with RDC. Definitive diagnosis of RDC requires direct visualization of the affected portion of the intestinal tract, either by laparoscopy, celiotomy, or necropsy. Because many cases can be managed medically, avoiding the costs, risks, and discomforts of surgery is desirable. Ultrasonography can be used to visualize a portion of the right dorsal colon but the technique is relatively insensitive. The peripheral (abaxial) wall of the right dorsal colon can be visualized sonographically through intercostal spaces 11 to 15, ventral to the ventral margin of the right lung. Abnormal thickening of the right dorsal colon can be observed sonographically in some cases. A report describing scintigraphic detection of right dorsal colitis has been described. Scintigraphic equipment is not widely available and too few cases have been evaluated to assess the sensitivity and specificity of scintigraphy.
Diagnosis of RDC is often presumptive, on the basis of a comprehensive assessment of findings of signalment, history, clinical signs, and clinical laboratory testing and diagnostic efforts to exclude other causes of the clinical signs. In our experience, early recognition of the condition is important because earlier recognition increases the likelihood of successful medical treatment.

F. Treatment
Treatment can be either medical or surgical. Because surgical treatment is difficult, expensive, and often unsuccessful, medical management should be attempted whenever possible. Medical management should address 4 areas: 1) avoiding NSAID use; 2) modifying the diet; 3) minimizing stress; and, 4) considering use of specific medications.

1. It can be difficult to adhere to the recommendation to avoid NSAIDs because horses with RDC that are managed medically often continue to have episodes of colic during the period of medical management, and NSAIDs such as flunixin meglumine are frequently used to manage abdominal pain. Moreover, some horses have a problem (e.g., chronic laminitis) for which continued use of an NSAID is deemed necessary. Because RDC may represent an idiosyncratic response in some horses, it is important to make efforts to avoid NSAID use in horses with RDC. Alternative analgesic agents, such as α2 agonists (e.g., xylazine) or opiates (e.g., butorphanol), should be used to manage painful episodes. If it is deemed necessary to use an NSAID in a horse with RDC, concurrent administration of misoprostol, a synthetic analog of PGE1, may help to limit adverse effects. If NSAIDs must be administered, using one such as ketoprofen that is less ulcerogenic should be considered. Availability of COX-2-selective NSAIDs for horses could be useful for horses with RDC, but COX-2 selective NSAIDs also delay healing of intestinal ulceration. It is worth repeating that RDC can develop in some horses administered NSAIDs at recommended doses during relatively short periods of time (e.g., 1 week).

2. Dietary modification is based on the premise that it is desirable to decrease the mechanical and physiological load of the colon. Consequently, a low-bulk diet is recommended. This can be achieved by feeding a diet of complete-pellets (i.e., pellets that contain at least 25% of dietary fiber on a dry matter basis such that adequate fiber is available in the absence of feeding additional roughage) and temporarily eliminating or restricting roughage from the diet. Pellets should be fed according to the manufacturers’ recommendations and divided into several small feedings during the course of a day (versus feeding a large amount twice daily). Because the cecum and large colon are the main sites of fiber digestion and exchange of fluid and electrolytes, a low-fiber diet may decrease the physiological load on the colon. If possible, hay or other large-volume sources of fiber should be eliminated from the diet. Some horses, however, will begin to eat their bedding or wood when hay is eliminated. For such horses, feeding small amounts of fresh grass or small amounts of good quality hay (preferably leafy alfalfa) should be considered. The optimal period for dietary management is unknown and likely varies considerably among horses. As a guideline, a period of 3 to 6 months should generally allow the colon to have sufficient time to heal.
Adding psyllium mucilloid to the diet may be useful for managing horses with RDC. When fed continuously, the intestinal flora begins to be able to partially digest psyllium, resulting in the production of short-chain fatty acids. In other species, psyllium mucilloid will increase the concentration of short-chain fatty acids (acetate, propionate, and butyrate) in the large bowel. Short-chain fatty acids can promote repair of colonic mucosa and may even reduce but evidence of sepsis may indicate a more poor prognosis. Some affected horses will be positive for fecal occult blood but such testing is relatively insensitive.
inflammation in the colonic epithelium. It is not known whether psyllium mucilloid will promote colonic healing in horses, nor is it known either how much psyllium should be fed or how long it should be fed. Feeding 2 to 4 ounces daily (divided among the multiple feedings of pellets) for 3 to 6 months is proposed.

Adding oils to the diet of horses with RDC may be useful. Fat will increase the caloric intake of horses, and many horses with RDC on a low-bulk diet lose weight. Corn oil has been demonstrated in rats and pony foals to increase the concentration of gastric PGE2. Whether corn oil would have a similar effect on colonic mucosa is unknown. Dietary sources of linolenic acid (e.g., linseed oil, fish oils) contain ∑-3 fatty acids. The ∑-3 fatty acids have anti-inflammatory effects. Thus, they might be expected to decrease the severity of inflammatory lesions associated with NSAID toxicosis. Unfortunately, some sources of linolenic acid are not particularly palatable to horses.

3. Minimizing physiologic stress and avoiding dehydration may improve recovery in horses with RDC. Curtailing or discontinuing performance, strenuous exercise, and transport represent useful management changes that owners can employ. Horses with RDC should have access to adequate amounts of fresh, palatable water and be encouraged to drink by providing salt (either in block form or granular form on their feed) or by flavouring their water.

4. Some specific treatments for RDC merit consideration. As previously mentioned, misoprostol, a synthetic analogue of PGE1 is of theoretical benefit to horses with RDC, inasmuch as synthetic PGE2 has been demonstrated to prevent ulceration of the gastrointestinal tract induced by phenylbutazone. Although the optimal dose of misoprostol for horses has not been established, administration of 2 to 3 µg/kg orally every 6 to 12 hours is proposed. Side-effects of oral administration of misoprostol to humans include nausea and gastrointestinal discomfort; however, colic or other intestinal side-effects of its administration to horses at the aforementioned doses appear rare.

It has been suggested that using sucralfate may be of benefit for treating horses with RDC. Although sucralfate might have cytoprotective effects in the colonic mucosa if it reached the area, it is unknown whether the drug would be of benefit. Sucralfate may be of benefit in horses with RDC that have concurrent ulceration of the glandular mucosa of the stomach. Administration of the recommended dose of sucralfate (22 mg/kg, PO, q 6 to 12 hr) is not inexpensive, but there are few side-effects.

Metronidazole has been used to treat human patients with NSAID enteropathies. In theory, administration of metronidazole might be of benefit to horses with RDC, because of its apparent anti-inflammatory effects in experimental animals with indomethacin-induced intestinal injury. Administration of metronidazole at a dose of 10 to 15 mg/kg every 8 to 12 hrs to horses with RDC is proposed. Horses treated with metronidazole should be monitored for the side-effect of inappetance; this can be difficult to assess in horses with RDC that are already inappetant. Sulfasalazine also has been used to NSAID-induced enteropathy in people. The effectiveness of this medication in horses with RDC remains unknown.

The benefit of intestinal protectants and absorbants, such as bismuth subsalicylate, mineral oil, or activated charcoal, for treating RDC is not known. Administration of plasma to horses with hypoproteinemia can be expensive and the transfused plasma may be rapidly lost into the intestinal lumen. Other colloidal solutions may be of benefit, provided that they do not induce or exacerbate colonic edema.

5. Methods for surgical management have included bypass, resection, or bougienage of the affected right dorsal colon. Although the prognosis for surgical treatment is usually poor, some horses have been successfully managed by either bypassing or resecting the affected portion of the colon. Surgical evaluation may be deemed necessary in some horses because of the severity of their pain. Celiotomy enables one to confirm a diagnosis of RDC by identifying characteristic lesions, to assess the extent of gross damage, and to exclude other grossly visible causes of clinical signs of colic.

References


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