DIARRHEA IN THE SENIOR HORSE

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Introduction

Horses have a relatively long life spans compared to other companion animals, and as they age, their needs change and additional care may be required. Important areas to consider when caring for the geriatric horse are nutrition, lameness, vision, immune response and hormone changes. The etiology of colitis in horses can be broadly divided into infectious and non-infectious causes. The prevalence of certain types of diarrhea will greatly depend on the environmental conditions and exposure to triggering factors. The age of the horse plays an important role, and different etiological agents can affect horses differently according to their age. Geriatric horses may be more predisposed to certain causes of diarrhea when compared to young or middle-aged horses.

Common causes of diarrhea in geriatric horses

Sand enteropathy

Sand ingestion and accumulation are associated with mild, severe or recurrent colic, acute or chronic diarrhea, and weight loss in horses. Accumulation of sand in the gastrointestinal tract can result in mucosal irritation, luminal obstruction and motility dysfunction. This condition has the potential to affect horses of any age, but more often mature animals over 10 years of age.

The diagnosis of sand enteropathy involves the exclusion of other potential diagnoses and the detection of colonic sand via one or several of the diagnostic test: abdominal auscultation, palpation of sand per rectum, fecal sedimentation, sand in enterogastric reflux, transabdominal ultrasound, abdominal radiography, or exploratory laparotomy.

Following colic, diarrhea is the most common presenting complaint in cases of sand enteropathy, with over 25% of the cases having loose manure with or without concurrent weight loss. Treatment often includes laxative therapy, and the combination of psyllium and mineral oil is most commonly used; the lack of laxative therapy has been associated with non-survival for these cases.

Medical management can result in clinical and radiographic resolution of colonic sand accumulation in mature horses and it carries a good short-term prognosis. The degree or duration of colonic irritation from

sand accumulation might affect disease severity and prognosis in horses with sand enteropathy. This condition should be considered as a differential diagnosis in horses with intermittent colic and/or diarrhea and evidence of a systemic inflammatory response, even if sand is not detected on transrectal examination or fecal sedimentation.

Inflammatory bowel disease

Chronic inflammatory bowel diseases (IBD) are associated with dysfunction of the gastrointestinal tract due to infiltration of the mucosa and submucosa with populations of eosinophils, plasma cells, lymphocytes, basophils or macrophages. Clinical signs include weight loss, dependent edema, lethargy and diarrhea. Most of the clinical signs are due to protein-losing enteropathy and malabsorption. Nearly all affected horses are examined for weight loss and anorexia, but about one third of the cases may present with other gastrointestinal conditions such as diarrhea and/or colic. Hypoalbuminemia is a common feature in inflammatory bowel disease, and it is attributed to the enteric loss caused by major structural alterations in the intestinal mucosa. A variant of the IBD is the multisystemic eosinophilic epitheliotropic disease, in which intestinal signs occur simultaneously with dermatitis. Signalment, clinical signs, clinicopathological findings and postmortem lesions may be highly characteristic of specific types of IBD.

Carbohydrate absorption test usually demonstrate abnormal absorption of either glucose or xylose. However, results could be non-conclusive in cases of disease that has not progressed to the point that villous absorptive capacity is impaired, or because lesions are so focal that they don't interfere with absorption. A retrospective assessment of the oral glucose tolerance test in 42 horses with weight loss demonstrated that total malabsorption of glucose of 12 horses was associated with either intestinal lymphosarcoma or granulomatous enteritis. Antemortem histologic examination of the rectal or duodenal mucosa contributes to the diagnosis of IBD, especially in the presence of intestinal clinical signs. Often, exploratory celiotomy and biopsy of grossly abnormal intestine confirms a diagnosis of IBD. In advanced cases, the use of abdominal ultrasound can reveal increase in thickness of the intestinal wall, mostly small intestine. With increase in thickness, motility is decreased and diarrhea can develop. Abdominal ultrasound can help as well in detecting any evidence of abdominal neoplasia.

The oral glucose absorption test consist of the administration of dextrose via nasogastric tube at a dose of 1g/kg body weight as a 20% solution. Samples for measurement of blood glucose concentrations are taken at times 0, 30, 60, 90,120, 150, 180, 210 and 240 minutes. The samples can be stored in sodium

fluoride tubes for further processing at a lab. The use of commercial stall-side glucometers are also accepted. The horse needs to be fasted for 14-16 hours, and it is important to note that results can be affected by stress, diet, length of fasting, gastric emptying rate and intestinal motility. Complete malabsorption is determined when there is an increase in blood glucose of less than 15% of baseline between 90-120 minutes after dextrose administration; being normal an increase of above 85% of baseline. Results that fall in between the 15 and 85% are consisted with partial malabsorption.

Parenteral administration of corticosteroids, tapered to achieve a minimal effective dose with fewer adverse effects, is commonly used in cases of IBD to reduce intestinal inflammation and abolish clinical signs. Degree and duration of response to therapy is highly variable among cases, depending on the degree of intestinal infiltration or the presence of metastasis in cases of intestinal lymphoma.

Intestinal neoplasia

Intestinal neoplasia usually affects horses over 15 years old. Alimentary lymphoma is the most common intestinal neoplasia in horses, followed by adenocarcinoma and smooth muscle tumors.

Altered stool character, ventral edema and recurrent fever have been associated with intestinal neoplasia. Affected horses often have profound weight loss in the face of normal caloric intake. Lymphoma can be detected using rectal biopsy in some cases. Clinical pathological parameters (anemia, neutrophilia, hyperfibrinogenemia, hyperglobulinemia, hypoalbuminemia) transrectal abdominal palpation and peritoneal fluid analysis (might be diagnostic in about 20% of the cases) are important tools that complement the diagnosis of intestinal neoplasia.

Lymphoma predominantly affects the small intestine and lymph nodes. Peripheral lymphadenopathy is not generally noted, but enlargement of the intestinal lymph nodes may be evident on rectal examination.

Adenocarcinoma is a malignant tumor that can occur in the small intestine, cecum and large colon. It has been mostly reported in middle-aged and older horses.

Gastrointestinal parasite infestation

Fecal parasite analysis is indicated in any horse with diarrhea. Infections with both large and small strongyles can cause diarrhea. Visualization of larva and high fecal egg counts (>200 epg) in the feces should raise suspicion of parasite associated diarrhea; however if in the hypobiotic state, FEC might be negative. Infection with small strongyles is well recognized as a cause of diarrhea in horses of all ages, however senior horses that are immunocompromised might be at a greater risk. Clinical disease is caused

by intramural larval stages, at the phase of emerging from hypobiosis, which in the Southeast occurs mostly in late fall and winter. Large numbers of larvae within the intestinal wall may cause motility disturbances, contributing to the clinical signs of diarrhea. The diarrhea is usually chronic, with a soft (bovine-type) consistency.

If horses did not have proper parasite control throughout their lives, this could lead to reduced nutrient absorption, lower ability to digest fiber and reduced gastrointestinal motility.

Infectious diarrhea

The most common infectious causes are bacterial and include salmonellosis, clostridiosis (*C. difficile* and *C. perfringens* type A), and Potomac horse fever (*Neorickettsia risticci*). Viral causes of colitis are uncommon in adult horses, although outbreaks of coronavirus in adult horses have caused fever, neutropenia, anorexia and loose feces in horses. Colitis can also be associated with dysbiosis of the normal bacterial populations in the cecum and colon. Antibiotic associated diarrhea is a cause of dysbiosis and can lead to severe signs of sepsis and shock.

Typical complete blood count findings in adult horses with colitis are leukopenia characterized by neutropenia and an increase in band neutrophils (left shift). Toxic changes in the neutrophils are also common indications of an overwhelming inflammatory reaction. Hemoconcentration is typically present and thrombocytopenia may be present in horses with severe sepsis from colitis and early disseminated intravascular coagulation. Changes on biochemical analysis vary depending on duration and severity of diarrhea. Horses frequently develop hypoproteinemia due to hypoalbuminemia. Electrolyte changes, typically of strong ions such as sodium, chloride and potassium depend on the stage of disease. Hypocalcemia is often present with severe SIRS/endotoxemia or anorexia. Prerenal or renal azotemia is also a frequent finding in dehydrated horses with colitis. If infectious diarrhea is suspected, appropriate biosecurity measures should be instituted.

Conditions in senior horses relating to the intestinal health

Specific husbandry measures may be required for the successful management of certain disease conditions in senior horses. Some studies have shown that older horses tend to have higher FEC, and due to the developing of antihelmintic resistance, proper parasite control should be continued. It is also known that immunosenescence due to aging results in poor immunity and an exaggerated inflammatory state. Focusing in the intestinal tract, an impaired immune system may alter the defense mechanisms of the intestinal mucosal surfaces. Conditions such as pituitary pars intermedia dysfunction (PPID) are almost

exclusive of geriatric horses, and will contribute to immunosuppression, therefore, endocrinopathies should be recognized and treated accordingly, to avoid predisposition to some of the infectious causes of diarrhea.

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