

Differential diagnoses for poor-doing horses



Bryan M Waldrige DVM MS DABVP DACVIM, Park Equine Hospital, Kentucky, discusses the common causes of ill thrift in horses

INTRODUCTION

Poor doing, or chronic weight loss cases can be very frustrating because many of the diagnostics performed are either equivocal or outright unrewarding. Often, the etiology remains unknown despite extensive investigation. One of the most common causes of poor body condition is inadequate dietary intake and it is difficult to convince a client that they need to start by simply feeding the horse more feed. This paper will summarise some of the more commonly encountered causes of ill thrift in horses.

ENCYSTED SMALL STRONGYLES (STRONGYLOIDOSIS)

Probably the most treatable differential diagnosis for weight loss and infiltrative/inflammatory bowel disease is encysted small strongyles. Larval (L3) small strongyles may encyst in the large intestine for months to years. For this reason, fecal egg per gram count may not be elevated because of large numbers of encysted immature parasites that do not produce eggs. The presence of the encysted larvae causes inflammation and emergence of large numbers of larvae into the intestinal lumen may lead to severe intestinal disease resembling colitis. In this author's experience, emergence of large numbers of small strongyles or colitis caused by larvicidal deworming are uncommon causes of large intestinal disease. However, encysted small strongyles are an important and difficult-to-diagnose problem and cannot be overlooked. Moxidectin (0.4 mg/kg, PO) is more efficacious in killing encysted L3 small strongyle larvae than the larvicidal dose (10

mg/kg, PO, q24h, for five days) of fenbendazole, likely because of the widespread resistance to benzimidazoles.¹ In addition, some researchers have reported histopathologic evaluation of colonic mucosa is less inflammatory after larvicidal deworming with moxidectin compared to fenbendazole, although the clinical significance of the difference in inflammatory reaction may not be significant.

CHRONIC IDIOPATHIC INFLAMMATORY BOWEL DISEASE

Inflammatory or infiltrative bowel disease (IBD) is not uncommonly encountered. Table 1 contains a list of possible etiologies that may be differentiated based upon clinical signs and histopathology. Diagnosis is usually made from a combination of abdominal ultrasonography, rectal or intestinal biopsy, and sugar absorption tests. Abdominal ultrasonography may reveal a thickened small intestine (>3-4mm) which may indicate some sort of inflammation and resultant intestinal thickening which increases the distance that nutrients must pass for systemic absorption.

The glucose absorption test may be easily performed in the hospital and potentially on the farm.² The horse is fasted for 12 hours and water is removed two hours before the test. A nasogastric tube is passed and 1g/kg of glucose in a 20% solution is administered. The glucose solution is most easily made using a stock solution of 50% glucose for intravenous infusion with water added as to the desired 20% concentration. It is important not to administer any α 2

agonists (xylazine, detomidine, or romifidine) to sedate the horse because these drugs can reduce insulin secretion for several hours after administration. Blood glucose is measured at time 0 (before intubation) and every 30 minutes afterward for four hours. Normal horses will have at least an 85% increase in blood glucose concentration within 90-120 minutes after glucose administration. Total malabsorption is an increase in blood glucose concentration less than 15%. Partial malabsorption is an increase in blood glucose concentration between 15-85%. Point of care glucometers work well to measure blood glucose concentration, especially because the trend in glucose concentration is most important and glucose can be measured instantly. If blood glucose samples are all measured at the same time, then blood should be collected into sodium fluoride tubes, which inhibit the enzymes of glycolysis or at least refrigerated immediately after collection. Sugar absorption tests evaluate small intestinal absorptive ability and it must be assumed that any malabsorption abnormalities affect both the small and large intestine. Rectal biopsy can be easily performed using a uterine endometrial biopsy instrument in a standing, sedated horse. The horse's rectum is emptied of feces and the biopsy is performed at either the 1:00 or 11:00 o'clock position in the rectum at approximately elbow depth. Before biopsy, the rectal mucosa should be palpated and differentiated by pinching the biopsy site and pulling ventrally. A double slip is palpated as the serosa and mucosa passes by and the rectal mucosa remains. Rectal mucosal biopsy is an all-or-none procedure, which will either identify the cause of intestinal inflammation or yield an equivocal result. Some inflammatory cells, such as eosinophils, are normally found in the rectal mucosa and submucosa, so histopathologic interpretation is very important to obtain a diagnosis of IBD.

Table 1.

Inflammatory and/or infiltrative bowel disease in horses

- Lymphoma
- Encysted small strongyles
- *Lawsonia intracellularis* enteritis
- Right dorsal colitis
- Lymphocytic-plasmacytic enterocolitis
- Multisystem eosinophilic epitheliotropic disease
- Granulomatous enteritis
- Idiopathic intestinal enterocolitis
- Focal colonic ulceration
- Other neoplasia (leiomyoma, adenocarcinoma, etc)

CARDIAC DISEASE

Cardiac disease may be an incidental or contributory finding in poor doing horses. The presence of a cardiac murmur

alone may not be significant, even if readily auscultated. Tachycardia, exercise intolerance, and poor peripheral pulses along with a higher-grade murmur provide more evidence of overt cardiac disease. A jugular pulse may also be observed. It is important to observe for jugular pulse when the head is in a neutral, and not grazing, position to avoid a false positive diagnosis. Murmurs of the atrioventricular valves, especially the mitral valve, are more likely to be clinically significant. Tricuspid valve murmurs are relatively common, even in young athletic horses, therefore echocardiography is often essential for any definitive diagnosis of symptomatic cardiac disease. In older horses, endocardiosis occurs over time and causes progressive thickening and insufficiency of the heart valves. Rarely, a heart valve may be thickened because of vegetative endocarditis. Usually, these horses have other clinical signs such as fever and possible polyarthritis. Ruptured chordae tendineae should be considered if signs of heart failure occur suddenly and the horse has no previous history of a cardiac murmur. Either of these conditions can be differentiated by echocardiography.

CHRONIC KIDNEY DISEASE

Many horses with chronic kidney disease (CKD) are asymptomatic until there is a hypovolemic crisis (colitis, heat stress, colic, etc) that causes dehydration and exacerbates renal impairment. Diagnosis is made by elevated renal indices (creatinine and blood urea nitrogen [BUN] concentrations) that do not respond or respond minimally to fluid therapy. Renal ultrasonography may reveal small kidneys with a subjective loss of corticomedullary differentiation. Occasionally, kidneys may be larger than normal or misshapen. Nephroliths, especially around the renal pelves, are often observed. Nephroliths may also be occasionally observed in horses with normal renal function. Whether this is a sequela of the previous administration of nonsteroidal anti-inflammatory drugs is unknown.

Hypercalcaemia is often present in cases of equine CKD, likely because equine diets tend to be rich in calcium and reduced excretory capacity of the renal tubules. In severe cases of CKD, hyponatraemia, hypokalaemia, and/or hypochloreaemia may also be observed due to the inability of the tubules to conserve electrolytes. Fractional excretion of electrolytes (FE; ratios of electrolyte excretion in relation to urine creatinine) is used to confirm urinary loss of electrolytes and tubular damage. Sodium (<1%) and chloride (<2%) are normally very tightly conserved. Fractional excretion of potassium is broader because of high dietary intake (FE 15-45%). Anaemia is variable and depends on the kidneys' ability to produce erythropoietin. Hypoproteinaemia and hypoalbuminaemia may be present if there is extensive glomerulonephritis. It is important to remember that equine urine is normally alkaline and will often produce a trace positive protein result on urine dipstick tests. Azotaemia combined with isosthenuria (SG approximately 1.012 in an adequately hydrated horse not being



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treated with intravenous fluids) confirms reduced glomerular filtration rate and an inability of the renal tubules to conserve water. Recently, symmetric dimethylarginine has been shown to be an early indicator of reduced glomerular filtration in horses compared to BUN and creatinine concentrations, which do not rise until approximately 75% of renal function has been lost.³ Treatment of CKD is largely supportive and symptomatic. It is very important to avoid dehydration and excessive nonsteroidal anti-inflammatory drug administration which will further reduce glomerular filtration. Blood calcium concentration can only be controlled by reducing dietary calcium intake (no legumes). Restriction of dietary protein intake to 10-12% of the diet is recommended and sufficient for maintenance, although previously assumed recommendations for protein restrictions in CKD are changing and may not be as necessary as once thought.⁴ Omega-3 fatty acid supplements, such as fish or flaxseed oils, have been shown to be beneficial in cases of CKD in small animals.⁵ Clean, palatable water should always be readily available to prevent dehydration. It may be advisable to turn out affected horses only at night to avoid heat stress.

CONCLUSION

Diagnostic evaluation of the poor-doing horse can be difficult, especially when results are normal or equivocal. In these cases, treatment aimed at preventable conditions,

such as underfeeding or internal parasitism, often improves body condition. Diagnostic procedures such as abdominal ultrasonography, absorption tests, abdominocentesis, and intestinal biopsy are useful to rule out neoplasia or chronic idiopathic infiltrative or inflammatory bowel disease. Echocardiography reveals both the source and severity of suspected cardiac disease.

AUTHOR

Bryan M Waldrige DVM MS DABVP (Equine Practice) DACVIM (Large Animal) Park Equine Hospital at Woodford, Versailles, Kentucky, USA.

REFERENCES

1. Reinemeyer CR, Prado JC, Nielsen MK. Comparison of the larvicidal efficacies of moxidectin or a five-day regimen of fenbendazole in horses harboring cyathostomin populations resistant to the adulticidal dosage of fenbendazole. *Vet Parasitol* 2014;215:100-107.
2. Ethell MT, Dart AJ, Hodgson DR, Rose RJ. Alimentary system in: Rose RJ, Hodgson DR, eds. *Manual of equine practice*, 2nd ed. 2000:273-339.
3. Schott H, Gallant L, Coyne M, Murphy R, Cross J, Strong-Townsend M, Yerramilli M, Li J. Symmetric dimethylarginine and creatinine concentrations in draft breed horses. 11th Annual European College of Equine Internal Medicine Congress 9-10 November, 2018. *J Vet Intern Med*, 2018;33:1547-1560. doi:10.1111/jvim.15447
4. Sanderson SL. Rethinking protein restriction in aging dogs and cats with chronic kidney disease. *Gerontology: An inside out perspective*. 2018:87-89.
5. Brown SA. Dietary polyunsaturated fatty acids and chronic kidney disease. *Gerontology: An inside out perspective*. 2018: 97-98.

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