Rethinking Gastric Ulcer Diagnosis

Understand better what’s going on in the equine stomach and beyond.

By Freedom Health, LLC
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Introduction

Studies continue to indicate that more than 80 percent of horses used in race or performance are afflicted with gastric ulcers. Further, omeprazole – long considered the “gold standard” for gastric ulcer treatment - has recently been shown to be ineffective in two specific applications. First, as a long-term solution for squamous gastric ulceration and, second, when used as the sole therapy in cases of glandular gastric ulceration. Scoping, while largely effective, still provides a somewhat limited view of the stomach—and none at all of the other 90 percent of the gut. Plus, it’s expensive, invasive and requires fasting, which can be detrimental for the horse.

Every practitioner makes a commitment to promote the welfare of the animals in their care. Therefore, equine vets must cultivate new approaches to managing gastric ulcers consider the entire gastrointestinal tract and the overall, long-term wellness of the horse.

Veterinary practitioners need a shift in perspective, recognizing that gastric ulceration represents only the tip of the iceberg of a much larger range of GI pathology afflicting performance horses. They need more accessible, reliable tools and methods that deliver more complete and accurate diagnoses. They need more effective treatment protocols. And, most importantly, they need to get at the root causes of poor digestive health in performance horses in order to truly ensure prevention.

Understand current limitations in diagnostics and review new methods for diagnosis for a more complete view of the horse’s GI health and better care for equine patients.
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Limitations in Common Diagnostic Methods

It’s not news to any modern practitioner that the lifestyle of equine athletes makes them particularly susceptible to digestive health issues. Husbandry practices (Luthersson et al., 2009), further compounded by training (Dionne et al., 2003), travel and competition (McClure et al., 2005), contribute to digestive health problems throughout the horse’s gastrointestinal system. Because these pathologies vary in location, etiology and treatment protocols, more comprehensive and accurate diagnostics are increasingly necessary.

Unfortunately for the veterinarian in practice, diagnostic options for detecting and managing GI tract conditions have proven to be limited. At least until recently, diagnostic modalities have generally proven to reflect reactive rather than proactive care. That is, they are best, and most frequently, used after a GI tract issue is already suspected or observed with diagnostic tools.
Reliance on Clinical Signs is Unreliable

Vets often look at the equine patient’s prior history and observed clinical signs (either directly, or indirectly by way of the owner or other caregiver) as the basis of their GI health diagnosis. While certainly not a true “diagnostic method,” the high cost and/or lack of availability of other, more sophisticated diagnostic approaches makes this a common practice in the field.

The first limitation of basing a preliminary diagnosis on clinical signs is that such signs—intermittent diarrhea, anorexia and/or colic—may arise later in the disease process, limiting the viable treatment options available to the vet. This leaves practitioners with options that are more costly, more risky, more invasive, and/or less effective.

Moreover, clinical signs often prove to be imprecise as a diagnostic indicator. This is particularly true in cases where common symptoms may, in fact, reflect any number of potential disease states.

Treatment Response is Risky

A second approach commonly used for diagnosis of GI tract conditions, including gastric ulcers, is the horse’s response (or lack of response) to treatment. This is most often the diagnostic approach used in situations where the client is unable or unwilling to pay for a more rigorous diagnostic method.

The most significant problem with a treatment/response approach to diagnosis is the risk of administering an inappropriate treatment approach. This means time lost going down the proverbial wrong road, which means delaying an appropriate treatment. It also results in unnecessary expense for the client. In worst-case scenarios, inappropriate treatments may prove risky to the health of the patient.

Vets in practice do have access to more substantial and proven tools to aid in the diagnosis of GI tract conditions. These, however, also have limitations.
Gastroscopy is Invasive

Visual assessment of the horse’s stomach via endoscopic examination ("scoping") is generally considered the most reliable method of diagnosing gastric ulceration. This common diagnostic procedure is moderately invasive in that it requires a period of fasting and sedation. Further, gastroscopy requires a three-meter endoscope, which many veterinarians in practice do not possess. This leaves veterinarians to refer the patient, and requires the additional step of trailer ing the horse to the secondary location. All of this puts stress on the horse and the owner and can ultimately prove to be an expensive proposition.

Gastroscopy is Limited

While gastroscopy is common and useful, research has shown that veterinary practitioners can readily miss lesions in the bottom of the stomach, and especially along the antrum and pylorus (Murray et al., 2001). Though gastroscopy techniques have improved over the years, limitations remain (Martinez et al., 2014).

Further, gastroscopy only visualizes the stomach and ignores the remaining 90 percent of the horse’s gastrointestinal tract. Emerging research indicates that horses are nearly as likely to have hindgut pathology, either alone or in tandem with gastric ulceration. As a result, ruling in gastric ulcers with gastroscopy does not rule out an accompanying hindgut pathology. Neither does ruling out gastric ulcers ensure that the rest of the horse’s GI tract is healthy.

Recent research shows that both glandular gastric ulceration and colonic ulceration are very real and common problems for performance horses. Practitioners must pursue differential diagnostics for any case of suspected GI disease.
Beyond Squamous Gastric Ulceration

Studies reveal that gastric ulceration is, in fact, two distinct syndromes: equine squamous gastric disease (ESGD) and equine glandular gastric disease (EGGD). Breed, usage and management may all be at play in the development of these diseases (Sykes et al., 2015).

<table>
<thead>
<tr>
<th>Horse</th>
<th>ESGD</th>
<th>EGGD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoroughbred Race</td>
<td>80-100%</td>
<td>47-65%</td>
</tr>
<tr>
<td>Standardbred Race</td>
<td>87%</td>
<td>n/a</td>
</tr>
<tr>
<td>Show/Sport</td>
<td>58%</td>
<td>64%</td>
</tr>
<tr>
<td>Endurance</td>
<td>66-93%</td>
<td>27-33%</td>
</tr>
</tbody>
</table>

*Figure 1. Incidence of gastric ulceration in various horse breeds and disciplines when in active training (Sykes et al., 2015).*
Because ESGD and EGGD are often unrelated, have different causative factors, and respond differently to omeprazole therapy, it is critical to distinguish between the two during diagnosis. A series of recent studies found that "only 25 percent of EGGD lesions healed within 28–35 days of omeprazole treatment at 4.0 mg/kg PO once daily, in direct contrast to an ESGD lesion healing rate of 78 percent" (Sykes et al., 2015).

In addition, scientists and veterinarians at Freedom Health have been working together to investigate less-understood hindgut issues first-hand. In 2003, Dr. Franklin Pellegrini, later Vice President of Veterinary Medicine for the company, conducted the first large scale necropsy study of gastric and colonic ulcers at an abattoir in Texas. That study, published in 2005, showed an incidence of colonic ulceration of 63 percent (Pellegrini, 2005).

In subsequent necropsy studies conducted between 2007 and 2011, significant incidences of both gastric and colonic ulcers were reported. Over the course of four separate studies, the prevalence of ulceration in the colon increased, to the point that almost all of 178 horses in 2011 were found to have lesions or other signs of inflammation in their colons. While these results reflect abattoir horses, which cannot therefore be applied to the horse population at large, the findings do suggest colonic ulcers are a very real issue.

<table>
<thead>
<tr>
<th>Year</th>
<th>Horses Sampled</th>
<th>Gastric Ulcers</th>
<th>Colonic Ulcers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>86</td>
<td>60%</td>
<td>87%</td>
</tr>
<tr>
<td>2008</td>
<td>111</td>
<td>43%</td>
<td>85%</td>
</tr>
<tr>
<td>2009</td>
<td>188</td>
<td>48%</td>
<td>74%</td>
</tr>
<tr>
<td>2011</td>
<td>178</td>
<td>79%</td>
<td>94%</td>
</tr>
</tbody>
</table>

It becomes highly problematic, then, that veterinarians have no definitive way to "see inside" the horse’s hindgut to visualize ulcers like they can with an endoscope in the stomach.

**Figure 2:** Post-mortem incidence rates of colonic and gastric lesions in horses, 2007-11

These limitations in typical GI diagnostic modalities put equine veterinary practice at risk of missing opportunities to provide quality care.
Emerging Diagnostic Tests

Given the high incidence of gastrointestinal disease, the impact such disease has on equine performance and well-being, and the relative inability to practically and reasonably diagnose the condition, it is highly likely that practitioners have many horses in their care with underlying conditions of which they are unaware. It’s also likely they won’t become aware until these invisible issues become visible when they reach a more serious clinical state.

Ongoing research continues to identify and hone options for identifying and classifying gastric ulceration in horses where clinical signs may not be evident. Several new studies offer interesting implications for practice.
INTRODUCTION

Equine gastric ulcer syndrome (EGUS) is common in all breeds and ages of horses and foals. This article focuses on the current terminology for EGUS, etiologies and pathogenesis for lesions in the nonglandular and glandular stomach, diagnosis, and a comprehensive approach to the treatment and prevention of EGUS in adult horses and foals.

KEY FINDINGS

• There is no pathognomonic clinical sign associated with this disease.
• Clinical presentation, presence of fecal occult blood, urinary sucrose concentration and response to treatment are all suggestive of the presence of ulceration in the proximal gastrointestinal tract.
• The only definitive diagnosis is made with endoscopic examination of the stomach.

Review the full paper:
Blood Sucrose Screening for Gastric Lesions

New research found that blood sucrose provides a sensitive test for identifying gastric lesions in foals, even when asymptomatic (Hewetson et al., 2018). Because foals are prone to developing ulceration at weaning, and many are asymptomatic, an inexpensive screening test is desirable for early detection.

Researchers studied 45 foals at 7 days before and 14 days after weaning. They reviewed the diagnostic accuracy of blood sucrose for gastric lesions; glandular lesions; squamous lesions and clinically significant gastric lesions at 45 and 90 min after administration of 1 g/kg of sucrose via nasogastric intubation was assessed using ROC curves and calculating the AUC. For each lesion type, sucrose concentration in blood was compared to gastroscopy.

While blood sucrose was determined to have high sensitivity for identifying gastric ulcers in general, its specificity is low so it does not replace gastroscopy. Additionally this survey requires multiple blood draws and intubations, further stressing an already challenging weaning process.

Post-ACTH Challenge Salivary Cortisol Concentrations for EGGD

Another group of researchers recently set out to better characterize the equine adrenal response to i.v. adrenocorticotropic hormone (ACTH) in horses, including those with and without gastric disease. Specifically as it relates to EGGD, researchers found that horses with moderate or severe glandular lesions had a larger and quicker increase in cortisol concentration following ACTH stimulation. The best diagnostic accuracy was identified at 60 min postinjection. (Sauer et al., 2018)

The wide confidence intervals, and thus the lack of diagnostic accuracy, do not presently support clinical use. However, the study’s characterization of the adrenal response to an ACTH stimulus does improve understanding of EGGD pathophysiology and its relation to stress.
The Need for A Better Diagnostic Approach

Veterinarians and their clients need a diagnostic method for GI tract disease that is more effective and more accessible. Such a diagnostic approach would:

- Allow for earlier detection, thus enabling earlier diagnosis, and earlier intervention before clinical signs appear.
- Provide an accurate diagnostic result, including differentiation of foregut from hindgut conditions such that a more targeted and effective treatment approach may be administered.
- Be completely non-invasive, reducing both stress on the animal and downtime before and following the procedure.
- Prove very affordable for the practice and offer economical sense for all horse owners.
- Be a stall side test available to every practice, reducing the need for referrals.

The ability of practitioners to identify dysfunctional GI issues allows them to administer the appropriate treatment before debilitating clinical signs, enhancing the chances of a successful outcome for the health and well being of the horse.
The SUCCEED® Equine Fecal Blood Test

The SUCCEED Equine Fecal Blood Test (FBT), from Freedom Health, LLC, provides veterinarians with an easy, affordable, and reliable tool to support the diagnosis of GI tract conditions in equine patients (Pellegrini, 2009). The SUCCEED FBT detects occult blood proteins in a fecal sample to serve as a point-of-care screening test for GI tract disorders. The FBT:

- Detects and differentiates foregut and hindgut issues.
- Is simple to use right in the barn.
- Provides results in 15 minutes or less.
- Requires only a fresh fecal sample and clean water.
- Is affordable, thus accessible for virtually any client.

The test utilizes equine-specific antibodies, one for hemoglobin (He) and one for albumin (Al). Due to the nature of these two blood proteins, they can be used together to determine whether their source is the foregut or the hindgut of the horse. Hemoglobin in the feces is indicative of injury anywhere along the GI tract. Albumin is destroyed by the acids and enzymes in the small intestine. Thus, Albumin detected by the FBT reflects a source caudal to the common bile duct, most commonly in the hindgut.
Evaluated in the Real World

An informal trial to evaluate the FBT in a clinical setting was conducted in 2012. (See figure 2 below.) Here, FBT results were gathered from equine patients at multiple practices. This includes both larger referral centers serving primarily performance horses (group 1) and smaller clinics (group 2) with a primarily leisure-horse clientele. The tests were specifically run on horses that did not present for GI tract conditions, in order to determine prevalence of GI disease in the horse population at large.

<table>
<thead>
<tr>
<th>Major referral centers, TX and CA (performance horses)</th>
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<tbody>
<tr>
<td>N=166</td>
</tr>
<tr>
<td>He - 47.6% He + 8.4% Total 56.0%</td>
</tr>
<tr>
<td>Al - 25.3% Al + 18.7% Total 44.0%</td>
</tr>
<tr>
<td>Total 72.9% He + 27.1% Total 100.0%</td>
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<table>
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<th>Smaller practices (primarily non-performance horses)</th>
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<tr>
<td>N=42</td>
</tr>
<tr>
<td>He - 78.6% He + 2.4% Total 81.0%</td>
</tr>
<tr>
<td>Al - 14.3% Al + 4.8% Total 19.0%</td>
</tr>
<tr>
<td>Total 92.9% He + 7.1% Total 100.0%</td>
</tr>
</tbody>
</table>

Figure 6: Fecal blood test results from equine patients at two groups of clinics -- group 1 representing primarily performance horses at major referral centers, and group 2 representing primarily non-performance horses at smaller clinics. Subject horses in all cases were presenting with issues not related to GI health.
An Adjunct to Scoping

The SUCCEED FBT alone is not a reliable diagnostic for gastric ulcers, due to the nature of how the test works. Because it relies on the presence of fecal blood or blood protein, non-bleeding gastric ulcers will not produce a positive test result.

However, the FBT may be used in conjunction with scoping. For example, in the face of a horse presenting with clinical signs consistent with gastric ulceration, but also producing a double-negative FBT result, scoping of the horse may help to confirm a gastric ulceration diagnosis.

Also, because the FBT detects any type of bleeding lesion, it is important for practitioners using it to consider as part of a differential diagnosis any type of pathological condition associated with blood loss. This includes heavy parasitism, recent dental work, recent rectal palpation and neoplasmia, among others, as these can all yield a positive test result.

Applications of the FBT

The SUCCEED FBT provides the practitioner with a useful tool in a number of situations:

- To assess any horse suspected of GI health pathology (to validate your preliminary diagnosis with additional objective data).
- As part of a basic workup and wellness program.
- As preventive medicine—to diagnose and treat conditions before they express as clinical problems.
- To gross screen a large group of horses to identify candidates for further investigation.
- As part of a pre-purchase exam.
Conclusion

This growing body of research and experience makes it clear that proactive maintenance of GI health should be a central discipline for the equine veterinary practice, especially for performance horses. Traditionally, nutrition and management are left to the owner, barn manager and trainer, and horses bear the burden. It is up to the veterinarian to provide leadership in this area.

Because scoping can be stressful for the animal, and is limited only to the stomach, practitioners should seek to minimize their dependence on it as the primary mode of diagnosis for ulceration. It is clear that the whole GI tract is at risk, especially when training and management stress the animal’s good health. And too many horses are being found to have ulceration throughout the GI tract even though they show no clinical signs.

Veterinarians have the opportunity to change the trend in poor digestive health among performance horses. By placing greater emphasis on ongoing care and management of GI health, and by testing regularly with the SUCCEED FBT, veterinarians truly become advocates for their patients’ wellbeing and provide a valuable service to their clients.
References


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