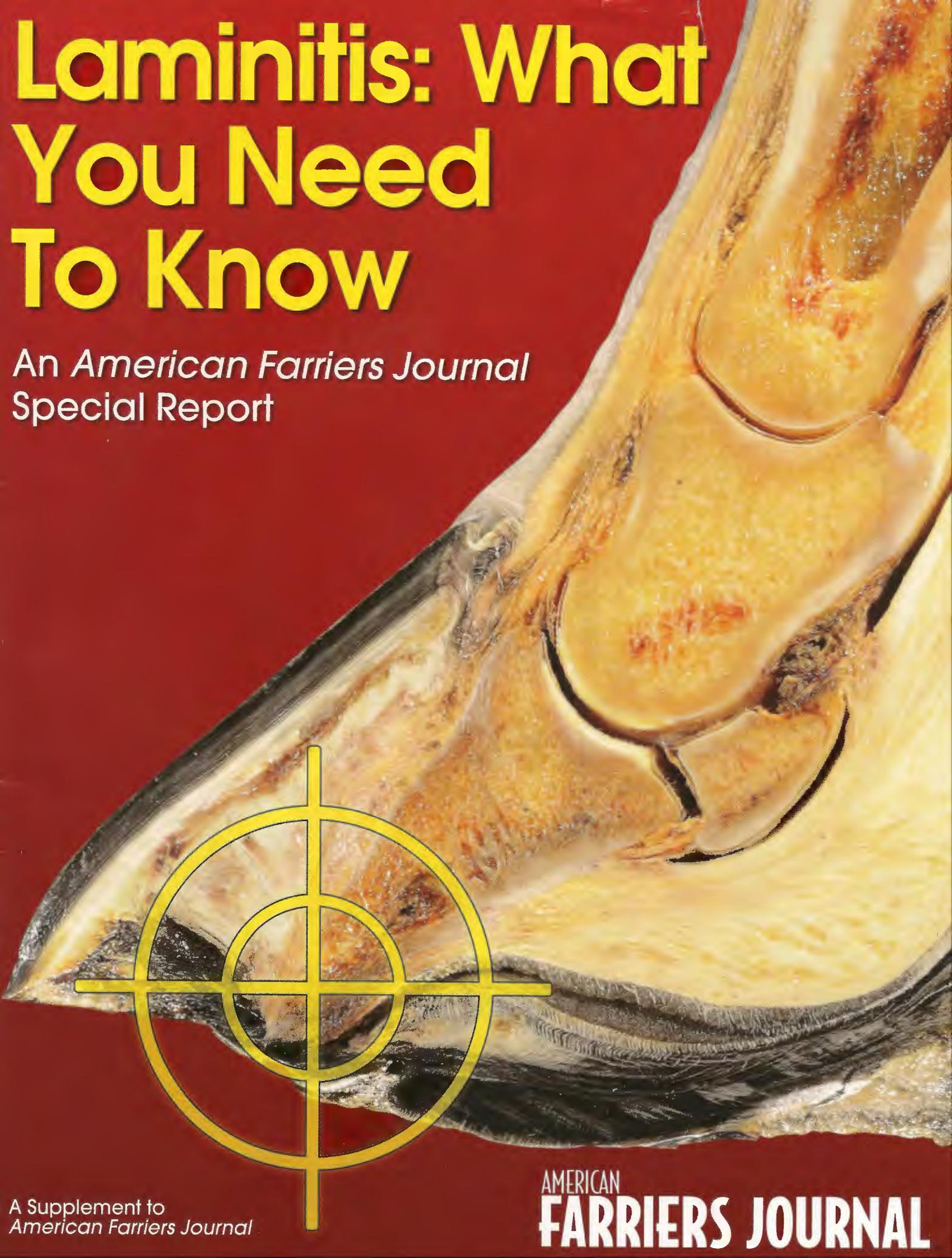


Laminitis: What You Need To Know

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How Cushing's, Insulin Resistance Impact Laminitis

The number of horses across the country that are insulin-resistant or suffering from Cushing's disease is exploding

By Frank Lessiter, Editor/Publisher

As horses age, the possibility they will develop Cushing's disease and insulin-resistance concerns dramatically increases.

A study conducted by University of Tennessee researchers found 56% of horses 13 years of age or older were affected by the Cushing's disorder. Cushing's has also been diagnosed in horses as young as 7 years, although this is rare.

Cushing's Defined

The clinical signs of Cushing's disease are associated with abnormally elevated hormone concentrations in the blood, along with other hormones such as cortisol.

Cushing's is more accurately defined as equine pituitary pars intermedia dysfunction (PPID), since this reflects the location within the brain that is abnormal. PPID functions include lengthening the hair coat, adding weight before winter and developing an increasing appetite as winter weather approaches.

With PPID, the middle lobe of the

pituitary gland (pars intermedia), which is located at the base of the brain, becomes enlarged over time. This leads to over production of hormones such as adrenocorticotropic (ACTH), which increases adrenal gland cortisol secretion.

Growth of the middle lobe can end up compressing the adjacent structures in the pituitary and hypothalamus, resulting in a loss of function.

Cushing's broadly represents any clinical situation that is attributed to the action of excess steroid hormones involved in metabolism. This includes the administration of glucocorticoid drugs and adrenal gland tumors, says Philip Johnson, a researcher at the University of Missouri.

When unmanaged, Cushing's-affected horses are at risk for laminitis, disordered glucose homeostasis (a pre-diabetic condition), and hoof soreness, says University of Tennessee researcher Frank Andrews. These horses are also immune-suppressed, increasing the risk for numerous infections.

Excess hormone production can



When a farrier is called out three or four times a year to deal with hoof abscesses on a horse, equine veterinarian Frank Reilly says it's likely the horse has an immune deficiency.

lead to weakened muscles, reduction of skeletal muscle, increased fat pads and new fat tissue arising on the neck, head, rump and abdomen. A combination of these factors can lead to saggy abdominal muscles, a potbellied appearance, bulgy eyes and laminitis. Increased thirst is another common side effect that leads to increased water consumption and urinary output.

Insulin-Resistance Concerns

Horses with PPID have also been shown to be insulin resistant. The insulin hormone is produced by the pancreas in response to elevated blood glucose levels that occur after feeding. In a normal horse, insulin stimulates the uptake of glucose by tissues.

However, insulin resistance is the failure of the tissues to respond appropriately to insulin. While the pancreas will continue to secrete insulin to compensate for a decrease in tissue effectiveness, the resting serum insulin levels will be high in horses suffering from moderate to severe insulin resistance.

HOOF-CARE TAKEAWAYS

- ➔ It's not always easy to understand the differences between insulin resistance and Cushing's disease.
- ➔ Farriers can detect these concerns at an early stage.
- ➔ Both Cushing's and insulin-resistance tests need to be done in the morning to get accurate results.
- ➔ Medical treatment can be costly, but there aren't many other alternatives.

New Doping Test Spots Insulin Levels

Researchers at the Hong Kong Jockey Club's racing laboratory have recently developed a test to detect even the smallest amount of insulin in the urine of horses. The goal is to detect illegal insulin doping in racehorses.

Due to insulin's ability to build muscle and improve endurance, the practice of illegally administering insulin to racehorses has become more prevalent in parts of Asia.

Older Horses Treated Like Family

Many of these problem horses are like family members to your clients and they're going to want you to do everything you can to help make them comfortable, says equine veterinarian Frank Reilly. The

owner of Equine Medical & Surgical Associates in West Chester, Pa., says the major concern is determining whether a problem horse is insulin resistant or has some degree of Cushing's disease.

Reilly says every horse over 15 years of age that entered the University of Pennsylvania's New Bolton Center over a recent 3-year period had enlarged pituitary glands.

"What was very interesting was that not every one of them had high ACTH levels," he says. "Horses can have an enlarged gland with either a normal or low rate of ACTH output. Or it can be a relatively small-looking gland with huge amounts of ACTH."

The result is a dilemma for a veterinarian trying to diagnose the specific problem.

"If it's just ACTH, we're likely going to place the horse on pergolide," says Reilly. "But if the horse has some form of insulin resistance, we have to be very careful about what we do as the wrong treatment can

cause an even bigger problem."

Fall Months Are Worse

Reilly finds most ACTH flare-ups cited in research literature tend to occur between September and December. Yet he's seen several cases occurring in late July that were detected in older horses that were being treated for painful feet.

These horses were on great programs, were getting great farrier care and were fed great diets. In these instances, some people would simply recommend doubling the pergolide dosage at this time of year.

"That's very easy to say," indicates Reilly. "But all of a sudden you have to tell clients that they're now going to be spending several hundred dollars a month on a retired 23-year-old horse. When that doesn't work, some vets would suggest doubling the dose rate again and the monthly medical bills are soon four times higher than they were in the beginning."

Besides, Reilly has found that doubling the pergolide doesn't help.

He has also seen a connection between winter foot pain and seasonal ACTH flare-ups. Horses with these symptoms sometimes don't show any signs of laminitis, and only about 50% get better with increased pain management.

"With a lot of these older horses, you have to be ready to jump on them early, even as early as the middle of September," Reilly says.

Two Tests Needed

Reilly recommends testing for both insulin and Cushing's when evaluating these suspect horses. He believes these tests need to be done early in the day, since insulin, as well as Cushing's levels peak in the morning.

"The ideal time would be around 10 a.m., or about 2 hours after the horses have been fed," he says. "Testing these horses at 3 p.m. is of no value."

Earlier in Reilly's career, he could not figure out why there was a false low number when the horses actually had a problem with insulin or ACTH.

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Chronic sore feet?
Rotation on X-ray?
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On Cushing's meds but still foot sore?
Stays large on little food?
Painful on hard or frozen ground?
Founder history?

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He urges veterinarians to carry a centrifuge in their vehicles, so they can perform these tests immediately, while still in the field. Both tests should be done within a half hour of drawing the blood sample.

Chronic Abscesses

Reilly says the normal signs of Cushing's disease are long hair, a crusty neck and curly hair on the legs. Laminitis is another major symptom, as are fat bulges over the eyes and increased urination. Yet another sign is chronic abscessing.

"When the farrier is called out three or four times a year to deal with more and more hoof abscesses, that's an immune deficiency," says Reilly. "Horses with cortisol concerns, which knock out the immune system, are more prone to foot abscesses due to small cracks, or an injury due to bruising of the hoof.

"One of the ways you can tell that pergolide is working is you'll have less abscessing."

Diagnostic Concerns

Data from researchers at the New Bolton Center indicates many of these affected horses have laminar damage, blood vessel damage, bone damage, coffin bone damage and nerve damage. Many also have a condition known as allodynia, an overly sensitive response to normal stimuli.

"Some of these horses will be walking like they are on glass and following well behind other horses in a group," he says. "The horse will be much more 'ouchy' than he should be when walking over stones. Soft ground is OK, then all of a sudden he's falling behind the rest of the gang when he steps foot onto a concrete alleyway."

Sometimes, the pain of these horses is due to nerve damage from past laminar injuries. When these horses' feet hit a rock or post, they're in incredible pain, as the sensitive nerve endings quickly flare up.

"All of a sudden, this older horse is laminitic, but it doesn't seem to be a

classic case of laminitis," says Reilly. "It's much like a winter laminitis case since there is no grass founder."

Early Detection Is Essential

Reilly urges farriers to learn the first recognizable symptoms of insulin-resistance and Cushing's disease.

"Farriers are the first line of defense and you're going to be seeing these problem feet way before the veterinarian," he says. "Vets only see most horses two or three times a year. You're trimming insulin-resistant horses practically every month. You're going to be the one who first knows when things go wrong. It's up to you to let the owner and vet know.

"If these horses are constantly sore after a routine trim, it's a major concern. When this occurs, owners need to get the horse tested. But this can be a problem for a farrier, because he's concerned the owner will fire him since the horse gets sore after every trim."

Reilly has found glue-on shoes can be helpful, especially with barefoot horses that need to get the hoof off the ground. He'll also sometimes prescribe boots.

Team Approach Needed

Reilly says it takes a team approach between the farrier, owner and veterinarian to effectively manage Cushing's and insulin resistance. The outcome won't be good unless everyone does his or her part.

"If you can figure out a way to work with these horses and be there and trimming month after month, you can become a specialist in this area," concludes Reilly. "The key is to develop the total package that helps these older horses." 

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On The Web

For more on new research findings regarding insulin's critical role in laminitis, go to www.americanfarriers.com/ff/laminitis.