

Challenges in Managing Horses With Metabolic Issues and Laminitis

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Part 1: The Complicated Underlying Problems

Laminitis is a devastating condition in which the laminae of the hoof become diseased or damaged, and the coffin bone loses its attachment to the outer hoofwall. The shifting of the bone inside the foot as a result of laminitis is called founder. If you have a horse afflicted with this devastating condition that is not getting better despite good farrier care, you are not alone in your frustration. The problem with treating laminitis is that the laminitis itself is not always the root problem; it is sometimes a result of deeper issues that may be ongoing.

Laminitis can be caused by many things. Twenty or thirty years ago, most laminitis cases were thought to be due to fairly identifiable causes. Common triggers were things such as fat horses on too much spring grass, or getting into the grain bin and gorging one meal, or a retained placenta in a foaling mare creating toxins in the blood. At times it is caused by some other disease process that creates toxins that affect the laminae. In very old horses, laminitis is a frequent result of Cushing's syndrome, a pituitary problem thought to be caused by a tumor and characterized by classic signs such as an extremely long hair coat.

Although all of those same things still cause founder, in the last couple of decades it has become more apparent that the vast majority of horses with laminitis or founder are afflicted with more complicated and sometimes vague metabolic issues. And these problems are showing up in much younger horses. Breed type and bloodlines seem to have some influence as well. (1,2)

Recently veterinarians are diagnosing more of these horses with metabolic issues being termed "Insulin Resistance" (IR), or "Pre Cushings Syndrome" or "Peripheral Cushings", or "Equine Metabolic Syndrome" (EMS). (2,3)

For ease of discussion I will use the term EMS.

EMS horses have a characteristic "look" about them. You may notice things like a cresty neck, even though they may not be overweight, puffiness about the eyes, "lumpy" fat deposits around the tail head and behind the withers, and later, a loss of overall body condition, a sort of "sagging" look. As well they may be susceptible to infections because of a lowered immune system. Sinus and tooth infections are fairly common.

It appears that EMS involves abnormalities or imbalances in one or more blood levels of insulin, or cortisol, or glucose, certain minerals and may actually be separate conditions that are somehow related, or all parts of one bigger condition. Though there is research ongoing concerning this issue, and plenty of theories, no one has presented definite answers yet.

Whatever the actual scenario, most affected horses have become unable to process carbohydrates correctly, sometimes resulting in high blood glucose and insulin levels, (just like type 2 diabetic humans). (1,2,3,4) With blood testing, some are found to have elevated fasting glucose levels, elevated insulin levels, or elevated cortisol levels, or a cortisol level that fails to fluctuate properly throughout the day. In a normal horse the cortisol is supposed to be lower at night. Therefore a “cortisol rhythm” test may be helpful along with other tests. (2,4)

The horse’s thyroid levels often test low as well, but some veterinarians believe that the low thyroid level is probably a secondary result of other imbalances, not the primary issue.

Veterinarians disagree on the best or most accurate blood tests to administer, but in my own farrier practice the horses with the most successful recoveries have been those who received thorough blood work, treatment based on those test results, and follow up blood work to monitor changes. I will give directions at the end of this article to resources where you can gather more detailed information helpful to the horse owner and veterinarian get more information.

The biggest challenge for the farrier is trying to manage the hooves of these affected horses while the metabolic problems are still ongoing. As long as there are active metabolic imbalances, the laminitis will still be active. In that case, no matter what the farrier does for the hooves mechanically, the horse may still be in pain due to recurring inflammation and instability inside the feet, and the feet can not heal.

Therefore it is up to the owner and veterinarian to find a way to control the metabolic problems. The horses who have the best results are consistently those who got the most intensive nursing and medical and dietary management from their owners.

This is easier said than done.

Managing the metabolic issues can be extremely complicated. It seems that one imbalance may be driving another, which drives another, and so on. So you may have several “vicious cycles” going on all at the same time. At any rate, the end result is chronic and sometimes unrelenting laminitis.

Though there is much disagreement among scientists as to exactly what IS the root cause that begins all this, the secret in getting it under control seems to be to break the cycle somewhere. Here are just a few of the difficult scenarios that may be going on.

Certainly horses that have been obese for a long time are at the most risk. “Easy Keeper“ breeds are especially susceptible .(1) Fat cells release an inflammatory chemical, TNFa . TNFa is speculated to cause “stress induced” insulin resistance and increased cortisol levels. (5)

Therefore it is dangerous to allow those breeds to develop a fat cresty neck just because the breed type is commonly seen that way. A cresty neck may NOT be normal in most breeds. We could be just so used to seeing it that it may appear the 'norm'. Most susceptible breeds include Pasos, Morgans, Arabians, Ponies, Mustangs etc. (1).

Most of the researchers and veterinarians agree that glucose intolerance is at least a large part of the problem. IR horses are similar to human type 2 diabetics. They have insulin, but the cells have become resistant to it, so it no longer moves the carbohydrates in the blood into the cell for use as food. So the blood levels of insulin get high as the body continues to try to process the carbohydrates, and the carbohydrates float around in the bloodstream unable to feed the cells. The laminae may then starve. (7) There may be gut toxins at work too, especially when the horse has been kept on long term "Bute" for the pain. (7,8)

Cortisol is another player, probably the most important one in this complicated scenario. Cortisol is naturally released into the bloodstream in response to stress, pain or inflammation.

Excess cortisol in the horses system causes a process called "catabolism", in which the cortisol scavenges protein out of connective tissues to gather "raw materials" for use elsewhere in the body.(9)

In the long term, catabolism weakens ALL the connective tissues in the body . For instance, dogs with Cushings syndrome sometimes are first presented to the vet with a ruptured Cruciate ligament.

This connective tissue weakening can cause not only tearing of the laminae in the hoof, but also chronic pain all over the horse. That may be why horses with 'full blown' Cushing syndrome get sore joints. It is also the probable reason that the farrier struggles so much trying to find comfort for these horses.

Plain grass hay has long been the recommended diet for foundered horses, and is still probably the best choice as the base diet and is recommended by most veterinarians. But beware, not all grass hay is the same! Recent research has shown that grass hay can vary widely in carbohydrate content. Some hay can be as high as over 25 percent carbohydrates! It depends on variety, geography, weather, harvesting times and so on. And a lot of carbohydrates in a meal will drive your horse's insulin response up as the body attempts to process it. STRICT limitation of carbohydrates is necessary. (6)

Katy Watts, forage researcher at www.safergrass.org therefore strongly recommends that your hay be tested for carbohydrates. This is not a normal hay test that your feed dealer would have done. The website has references where to get that done. In the absence of testing, she has also done research that shows how soaking the hay can extract some of the carbohydrates. Please visit that site for more information.

As well, lowering carbohydrates means no more grain, molasses, sweet feeds ,sugar, apples or carrots. And no cheating! But your horse DOES needs good overall nutrition and SOME good carbohydrates to feed his cells and repair tissue, as well as plenty of protein, a little fat, and balanced minerals and vitamins. However it is not prudent to just toss in more of anything without first knowing what you are starting with. This means knowing the nutrition content of your hay .(3)

Because of the growing demand for low starch but nutritionally complete diets, several feed companies are now manufacturing low starch, forage based, supplemented pelleted feeds.

Two examples are LMF Stage 1 and LMF complete, (LMF is the only one that tests the hay that goes into the pellets) and Triple Crown 'Low Starch'. There are probably other brands too so you will have to check your local dealers.

Do NOT just trust that a feed is low carb simply because it is not a sticky molasses filled "sweet" feed. Read the labels and look for 'red flags' such as grain and molasses. Senior feeds can be particularly dangerous if they contain grain or molasses.

Most practitioners also agree that dietary supplementation is also useful. Many horses in my hoofcare practice have improved with careful supplementation to balance their minerals, and removal of carbohydrates from the diet.

Magnesium is an important mineral.

Magnesium regulates **many** hormonal functions. Though the veterinary community is mixed on its feelings about the helpfulness of mineral supplementation, there are consistent anecdotal reports of supplemental magnesium helping these horses more rapidly lose the cresty neck, lose the excess weight, and regulate the thyroid levels.

Chromium Picolinate has been shown in Human type 2 diabetes to help process carbohydrates, so it too is being used to help treat these horses.

There are many feed supplement companies that have these supplements available by mail order. One example is Uckele Animal Health. (www.uckele.com). Many natural supplement companies are making supplements available specifically for "IR" horses. Uckele has one called Glycemic EQ" which contains chelated magnesium, chromium, as well as other ingredients for hoof growth, all ready mixed.

Zinc, copper and manganese are important to help grow hoof and connective tissue.

As well, Manganese deficiency may also be a factor in the development of insulin resistance.(11)

Sulfur, (found in the joint supplement MSN) is an important structural component as well as an anti oxidant.

Some veterinarians also say that laminitis is an example of “free radical damage out of control” (8) and therefore employ anti-oxidants with good results. Anti oxidants include but are not limited to CoQ10 enzymes, MSM, and Vitamin C.

Many horse owners as well as their veterinarians are using homeopathic and herbal medications.(3,8,10) Each has a very specific and sometimes strong action so please consult a trained veterinarian herbalist before you just toss any to your horse. . These include (but are not limited to) Slippery Elm bark, Hawthorne berry, and Chaste berry.

In the cases where diet and feed supplements do not get the metabolism under control. There are medications your vet may want to try. In the past, veterinarians used Cyproheptadine, but more common now (and reportedly more effective) is Pergolide mesylate (Permax). Most veterinarians reserve it for the most stubborn cases but some practitioners use it on all their cases or as a diagnostic tool. (1) As a diagnostic, the reasoning is “If the horse gets better, he probably has Cushings and therefore needs the drug.”

The major considerations to using either of these this drugs are the both may cause or exacerbate liver impairment over time,(12) and Pergolide is relatively expensive. Also, most veterinarians say once a horse gets better on it, he must stay on it. That may be debatable though, because of anecdotal reports of its successful use seasonally or just when as the horses have laminitic relapses. (12, and personal anecdotal reports)

It all boils down to the fact that the veterinarian and horse owner must really dig deep to try to stabilize the horses problems. If you don't get to the root of the problem, the horse's chances of recovery are slim and the all farrier work in the world will not help. Once the metabolism are balanced out, many of these horses go well barefoot or with fairly simple therapeutic shoeing. If the metabolism is out of control though, nothing will help.

Some resources I strongly recommend are as follows:

1) Yahoo.com EquineCushings discussion group.

Go to Yahoo.com, click on “Groups” and join the EquineCushings group. It is free. When you get there, click on “files” in the left side of that homepage.

Read the “START HERE” file first to get yourself oriented.

Then, go back into “files” and scroll down to the “JOHNSON ON METABOLIC SYNDROME” file.

It is a wonderful dissertation by Dr. Phillip J. Johnson from University of Missouri, and is a Must Read” , in my opinion.

After that just read all the files you can. There are lots of scientific papers on supplements, feeding, Hoofcare and so on.

For endocrine testing: BET labs in Lexington Kentucky will do consultations with your vet if they want to help understanding some of the tests and exactly how to administer and interpret them. BET labs is found at www.betlabs.com.

The phone numbers in KY are (859) 273-3036, fax (859) 273-0178

Dr Eleanor Kellon, at the Yahoo group also does consultations.

For finding out more about general hoofcare, including laminitis, go to the “The Farrier and Hoofcare resource Center”, at www.horseshoes.com. The Discussion Forum has two bulletin boards devoted to laminitis, one for farriers and one for horse owners. As well, that site has Dr. “Tookie” Myers as their consulting veterinarian and he also does individual consultations.

Bibliography

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- 4) BET endocrinology laboratory, Lexington Ky. www.betlabs.com
- 5) Dr. Barry Fitzgerald, University of KY , referenced in www.horseproducts.stablemade.com
- 6) Katy Watts, www.safergrass.org
- 7) Dr. Chris Pollitt, University of Queensland, Au.
- 8) Dr. Madelyne Ward DVM,, Dr. Joyce Harman DVM MRCVS “Laminitis Treatment, A natural Perspective”, Hoofcare and Lameness Magazine
- 9) “Is Cortisol leading You Down the catabolic Pathway? Rehan Jalali, @ThinkMuscle .com
- 10) Yahoo Groups, EquineCushings @www.yahoo.com
- 11) Complete Book of Minerals For Health , J.I.Rodale and Staff, 1974
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