

## Equine Metabolic Syndrome

aka

“Peripheral Cushing’s Syndrome”, “Pseudo-Cushingoid Syndrome”, “Insulin Resistance Syndrome”, and “Hypothyroidism”

Jenifer R. Gold, DVM

“Equine Metabolic Syndrome” describes horses that are characteristically obese, have an age ranging between 8-18 years, and are what horsemen refer to as “easy keepers”. No sex predilections have been described, but some breeds, including Morgans, Mustangs, Warmbloods, Peruvian Pasos and ponies are overrepresented. Most, but not all, affected horses are obese. Distribution of body fat in metabolic syndrome horses is characteristic, most often concentrated in a large “cresty neck” and in fat pads on the rump. However, many of these horses tend to be distinctly overweight in a generalized fashion. Equine metabolic syndrome has some similarities to Type II diabetes in humans, in that affected animals do not metabolize sugars normally due to insulin resistance

Mares that are affected tend to have abnormal estrus cycling and can be very difficult to breed successfully. Affected geldings tend to have an enlarged sheath, which is associated with enhanced subcutaneous adiposity (fat deposition). Ponies tend to develop obesity and laminitis more readily than their horse counterparts.

These horses are commonly misdiagnosed with hypothyroidism, particularly those that develop laminitis. Unfortunately, this diagnosis reflects an outdated school of thought. If metabolic syndrome horses are tested with thyroid stimulation tests, test results are within normal limits. These horses may have low resting thyroid levels, but a definitive explanation for the decreased hormones is lacking. It does not however, seem that a decreased level of thyroid hormones is a primary problem, as it doesn’t explain the clinical signs we see; research has shown horses that have the thyroid gland removed neither develop laminitis nor become obese. Metabolic syndrome horses may be obese and laminitic, but it is not a manifestation of insufficient thyroid hormone production.

Metabolic syndrome horses also have normal dexamethasone suppression tests and ACTH stimulation tests, meaning that they are not affected with true Cushing’s disease. Affected horses may have normal or elevated glucose concentrations. Serum insulin and FFA levels tend to be increased as well.

Diagnosis of equine metabolic syndrome (obesity associated insulin refractory state) at this time is based on physical characteristics of the horse, results of routine hematology and biochemistry panel, elimination of other differential diagnoses, and results of glucose tolerance testing.

Affected horses should be fasted prior to testing glucose and insulin levels so digestion does not influence variation in concentrations. An insulin refractory state can be tested by using intravenous or oral glucose tolerance test in which at both insulin and glucose values are followed over time post glucose administration.

Treatment options are somewhat limited in these horses, as are diagnostic tools. Exercise, diet and weight loss are the cornerstones of a treatment plan. Feeding horses a low starch/sugar ration (low glycemic index) that still has good forage quality is extremely important, as is providing a correct balance of vitamins and minerals. Analysis of hay through a commercial

feed analysis laboratory is very helpful in determining whether it has an appropriate starch and sugar content, as it's impossible to tell from visual inspection alone. Central Oregon is blessed with extremely high quality orchard grass hay, which unfortunately, usually has very high sugar levels and is not acceptable for metabolic syndrome horses. Other more appropriate dietary options can include timothy hay, beet pulp without molasses, and a variety of newly available commercial low carb pelleted feeds. High sugar hay can also be modified by soaking in water for 30 minutes before feeding to reduce sugar content; hay that is rained on after being cut and before being baled can experience the same effect, and be a good option as well.

Increased exercise also helps reduce weight and improves insulin sensitivity. Vitamin E as an antioxidant has also been used with some success. Various other remedies have been noted to result in improvements in some horses, *i.e.*, magnesium, chromium and vanadium. More investigation needs to be done, however, before these supplements can be recommended in every case. Thyroid supplementation is not advocated due to potential side effects, except for short-term therapy as a weight loss aid in a few cases.

Management of laminitis is often a key concern in affected horses as well. As in any case of laminitis, working with a veterinarian and farrier to develop an appropriate trimming and shoeing plan based on radiographic exams of the feet is of paramount importance in affected horses' comfort and longevity.



Horses showing characteristic “cresty” necks associated with equine metabolic syndrome.