

Management of Equine Cushing's Disease and Equine Metabolic Syndrome
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Equine Pars Intermedia Dysfunction (PPID) also known as Equine Cushing's Disease

Hyperadrenocorticism is one of the most frequently diagnosed endocrine abnormalities of the horse. It is one of the most common diseases of horses greater than 15 years of age. The clinical signs associated with what has historically been recognized as abnormally elevated cortisol levels or Cushing's syndrome is better defined as **Equine Pars Intermedia Dysfunction (PPID)**. Cushing's syndrome in humans has a different origin within the pituitary gland than the horse which is why there has been a shift to call this problem PPID in horses. The clinical disease has been well recognized for years, but the pathophysiology remains poorly understood.

Clinical Signs

Clinical signs of PPID can vary probably depending upon the stage of disease. The average age is 20 years but the range is 7-42 years of age. Over 85% of the horses are > than 15 years of age. Ponies and Morgans have a high incidence of the disease.

1. Hirsutism (long curly hair coat) is a common finding and is characterized by failure to shed a long curly hair coat. The coat may become thin and long, the underlying skin thin and flaky.
2. One of the most common clinical complaints includes polyuria/polydipsia (drinking too much and urinating too much). PU/PD in the horse is characterized by intake of water over 25-30L. Owners' complaint of a consistently wet stall.
3. Laminitis can be seen in horses with pituitary dysfunction.
4. Lethargy or docile attitude.
5. Hyperhidrosis (excessive sweating)
6. Ravenous appetite
7. Muscle mass atrophy
8. Bulging eyes are not uncommon and are due to abnormal redistribution of supraorbital fat.
9. Blindness due to compression of the optic chiasm by the enlarged pituitary.
10. Immunosuppression -Repeated infections are common with sole abscesses, tooth root infections, and sinusitis.
11. Infertility

Therapy

Treatment seldom achieves complete resolution or remission of disease. Reasons to treat:

1. Quality of life may be enhanced through treatment.
2. Infertility may be temporarily overcome by treatment of older broodmares with confirmed pituitary adenoma.

Two drugs are currently available to treat PPID:

1. Pergolide
Dose: 0.5 to 2 mg total/adult horse per day, although expensive, has had beneficial effects. Maximum dose should not exceed 6 ug/kg.

Horses should be started at a lower dose for 4-6 wks.

After treatment for this period, a dexamethasone suppression test is repeated. If the horse suppresses, treatment at this level should be maintained indefinitely. If the horse does not suppress, increasing the dose by 0.25 mg until a response is noted is recommended.

Compounding pharmacies have made this drug much more available to the horse owner. For example Franck's Pharmacy in Ocala formulates 1 mg/ml for 60 mls. Remember that you get what you pay for. A cheap pharmacy may be selling a product that does not contain any of the prescribed medication.

2. Cyproheptadine

Dose: 0.25 mg/kg daily.

The results of treatment with this drug are mixed. If no improvement is noted, the dose can be increased to twice daily intervals. Some studies indicate that it is marginally effective and controlling clinical signs.

3. Supportive care is also important for enhancement of the quality of life of these horses. Very often these animals are pets, foundation stallions, and valuable broodmares. Their value is usually intrinsically emotional rather than economic. Most owners are interested in either prolongation of breeding through a few more seasons or improving the quality of life of an old pet.

1. High quality preventative medicine consisting of regular deworming, dental care, and consistent farrier work are important.
2. Aggressive treatment of sole abscess, corrective shoeing for laminitis, NSAID's for pain are all indicated.
3. In the warm months, clipping of unnecessary hair to minimize skin infections is important.
4. In the cold months, blanketing may be indicated for those individuals with a long but thin hair coat. It also may provide some energy conservation for maintenance of body condition.
5. Maintaining body condition is a primary concern. Because these horses do not utilize glucose normally, overfeeding is contraindicated. Likewise, weight loss can contribute to poor muscle tone and wasting. Complete feed rations formulated for the older horse may add bulk and fat without overwhelming carbohydrate levels.

Equine Metabolic Syndrome

The term equine metabolic syndrome (EMS) has been adopted to describe any horse or pony with chronic insulin resistance that does not suffer from PPID. (Frank, ACVIM proceedings 2008).

Definition -EMS is currently defined as horses with the presence of:

1. Insulin resistance
2. Obesity and/or regional adiposity
3. Prior or current laminitis (evidence of founder rings or rotation of P₃ on radiographs)
4. Often the horse is a “easy keeper”

Clinical Signs

The most common breeds affected are pony breeds, Morgans, Paso Finos, and Norwegian Fjords. But Arabians, Quarter horses, Thoroughbreds, Saddlebreds, Tennessee Walking Horses and Warmblood have been diagnosed with the syndrome. The age that most horses are affected is between 10-20 year although horses from 5-15 years of age can be affected. Most of these horses are obese for several years before insulin resistance develops. The clinical signs vary:

- Laminitis – often begins in the spring with rapid growth of grass
- Colic can be associated with pedunculated lipoma formation at an early age
- Obesity has been linked to abnormal reproductive cycling in mares
- General obesity with regional and/or regional adiposity
- Cresty neck, fat deposits around the tailhead, sheath and supraorbital fossa, with occasional subcutaneous masses on the trunk

Treatment

The goal of treatment is to improve insulin sensitivity and thereby raise the threshold for laminitis and to avoid alteration in the diet that might result in a gastrointestinal disturbance that could trigger an episode of laminitis. Insulin sensitivity can be improved by reducing body fat and avoiding feeds high in starch and sugar.

Managing Obesity- Obese horses should eat a simple diet of hay and a vitamin/mineral mix. Weight loss can be achieved by increasing exercise and controlling the diet. Hay should be fed at 1.5% of body weight and then lowering the amount to 1.5% of the ideal body weight. The hay chosen should have a lower (<12%) of non-structural carbohydrate content. If the hay can not be tested, soaking the hay in cold water for 30 minutes will lower the sugar content prior to feeding. Grass or alfalfa hay can be fed. Additional Vitamin E can be added (1,000 IU) daily.

Managing Insulin Resistance- Pasture access should be restricted or eliminated because of the large concentration of sugar that varies in the grass. Most horses and ponies can handle 1-2 hours of grazing a day. The remainder of the time they should be housed in a dry lot or wear a grazing muzzle. Eliminate all treats such as sugar cubes.

Management of lean horses with regional adiposity- Some horses with EMS may be leaner but have regional adiposity. These horses will require more than just hay for their diet. Things to consider in choosing a concentrate are; what is the carbohydrate composition, what is the glycemic response and feeding practices at the farm.

1. Feed a diet consisting of hay (<12% NSC) , soaked molasses-free sugar beet pulp, balanced vitamin and mineral supplement and 0.5 cup rice bran oil or corn oil twice a day.
2. The same diet with a commercial low-starch specialty feed substituted for beet pulp.
3. Feeding either of the 2 diets above with 1 pound of rice bran instead of corn oil.
4. Feed a pelleted feed designed for old horses.

Supplements and drugs affecting insulin sensitivity

Levothyroxine Therapy

Weight loss can be accelerated and insulin sensitivity improved by administering levothyroxine sodium (Thyro L®) in the feed at the dose of 48 mg/day for 3-6 months which is equal to 4-6 teaspoons/day. The horses should be weaned off the drug by lowering the dose to 24 mg/day for 2 weeks and then 12 mg/day for 2 weeks. This medication must be obtained from your veterinarian.

Corticosteroids

Dexamethasone treatment can induce insulin resistance in horses (Firshman et al. 2005, Tiley et al. 2007). The use of corticosteroids in insulin resistant horses or ponies should be used with caution because of the potential to induce laminitis.

Chromium

Chromium picolinate supplements have been reported to enhance insulin sensitivity in older animals. It is commonly used in humans with varying degrees of glucose intolerance. The proposed mechanism of action involves increased insulin binding. Two conflicting studies in horses make it difficult to confirm the benefits of supplementation in equine species. (Ralston, 2002).