

Equine Cushing's Disease: Equine Pituitary

Pars Intermedia Dysfunction

Better known as Cushing's disease, equine pituitary pars intermedia dysfunction or PPID is a syndrome where a part of the brain, the pituitary, becomes enlarged and overactive. The pituitary is located at the base of the brain. In PPID the middle lobe, the pars



intermedia, becomes enlarged over time into what is often (incorrectly) called a pituitary adenoma and results in the over production of many hormones. In affected horses the pars intermedia produces excessive amounts of pro-opiomelanocortin (POMC) which is broken down into various other hormones, including adrenocorticotrophic hormone (ACTH) and melanocyte stimulating hormone (MSH).

Normally this function is kept in check by the neighbouring hypothalamus, which is in charge of regulating thirst, hunger, body temperature, water balance, blood pressure and other vital functions via secretion of dopamine.

Pituitary pars intermedia dysfunction disease is one of the most common diseases of horses greater than 15 years of age. The average age of horses diagnosed with PPID is 20 years. PPID affects >20% of horses ≥ 15 years of age. Although it is most common in aged horses, PPID has been diagnosed in horses as young as 7 years of age. Though this disease affects countless horses every year, still much needs to be learned about its effects and process.

The clinical signs of PPID vary with each horse. While the exact mechanism that causes these clinical signs is unknown it is thought to be due to the excessive production of POMC derived compounds. The most recognized sign is a long, curly hair coat that fails to shed properly. This is known as hirsutism, and is a clinical sign specific to PPID. Other symptoms

can include a failure to shed well in the spring, excessive drinking and urination, laminitis, lethargy, excessive sweating, or lack of sweating, muscle mass loss, a sway back, pot belly, loss of hair colour, repeated infections, infertility and redistribution and abnormal accumulation of fat. Horses with PPID may also have hyperinsulinemia, or high blood levels of insulin. Hyperinsulinemia is also known as insulin resistance. This is where the tissues of the horse fail to respond to the natural increase in insulin stimulated by carbohydrate and sugar intake. The lack of response by the body causes the pancreas to continue to secrete insulin in an attempt to deal with higher sugar levels in the blood. The elevation in circulating insulin also contributes to the clinical signs associated with PPID. Essentially some of these horses also have a type II diabetes-like syndrome.

There are a few ways to diagnose PPID. The best indication of the disease is hirsutism in the aged horse. This is the most sensitive test of PPID available, however it only becomes apparent during more advanced disease. Occasionally we see horses that shows clinical signs that may be associated with PPID, but are too early into the clinical course of the disease to detect it without laboratory testing. Unfortunately, no test is 100% accurate. The two most commonly used tests are the resting ACTH test and the overnight dexamethasone suppression test (ODST). Other tests that have been advocated for PPID diagnosis: the thyrotropin releasing hormone test (TRH), fasting insulin concentration and the circadian cortisol test however their diagnostic rates have not been proven and aren't therefore they aren't used regularly. Though testing is not necessary for diagnosis of PPID it is essential for monitoring the response to treatment. Seldom does treatment achieve complete remission of disease, however it does significantly improve the horse's quality of life.

Of the readily available tests, the ODST is the most accurate measurement of PPID. However, ODST is not without its drawbacks. It requires two visits to the farm by the vet, which increases the cost to the owner and it requires the administration of dexamethasone, a steroid. There are concerns that administration of steroids to an animal already prone to laminitis may cause a flare up of the syndrome.

The drug of choice for treatment of PPID is pergolide mesylate or Prascend (made by Boehringer Ingelheim). It is currently the only approved therapy for PPID on the market. This medication works by mimicking the inhibitory action the hypothalamus has on the rest of the body. It helps to reduce the amount of ACTH and other POMC derived

hormones produced by the pars pituitary. A good response to therapy is associated with improvement in clinical signs or normalization of the results of an ODST or ACTH test.

In addition to pharmaceutical treatment, horses with PPID will benefit from multiple other management strategies. Since most PPID horses are also insulin resistant they should be fed hay that is less than 10% non-structural carbohydrates (NSC). Non structural carbohydrates are also known as sugar and starch. If the hay has not, or cannot, be tested it should be soaked for a minimum of 30 minutes in water to reduce the NSC available to the individual. Access to lush green pastures should be monitored closely and should be limited if the high NSC content is known to cause bouts of laminitis. Pelleted or other types of complete feed should be avoided where possible and replaced with diets high in fiber and fats. Many feeds are available that are specifically designed for senior horses and those that are metabolically challenged. Care should be taken to ensure that feeds combined with sugar or molasses are avoided. As with all aged horses, dental care and regular deworming is essential to their longevity. An appropriate schedule should be worked out with your regular veterinarian.

While managing laminitis cases a relationship between you, your farrier and your veterinarian should be established. This way your farrier can trim and shoe appropriately based on x-rays taken by your veterinarian. Your veterinarian can also help manage chronic pain by prescribing one of many different medications. Therapies such as laser therapy, herbs and acupuncture may also be of great help to your horse to manage the pain associated with laminitis.