

Equine Pituitary Pars Intermedia Dysfunction (Equine Cushing's Syndrome)

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Quick Facts

- Pituitary pars intermedia dysfunction (PPID) is an endocrine disorder in horses.
- PPID affects up to 25% of older horses over age 15.
- A veterinarian can diagnose PPID through a hands-on exam and testing adrenocorticotrophic hormone (ACTH) levels in the blood.
- Common PPID symptoms include delayed shedding, increased urination, increased water intake, immunosuppression, weight loss, muscle wasting, laminitis, and lethargy.
- Treatment includes medication and dietary management.

Equine Pituitary Pars Intermedia Dysfunction

Pituitary pars intermedia dysfunction (PPID), also known as equine Cushing's disease, is an endocrine disorder that affects a horse's pituitary gland. This disease is particularly common in older animals, affecting up to 25% of horses aged 15 years or older. Common symptoms of PPID include delayed coat shedding, long curly hair, pendulous abdomen, muscle wasting, increased thirst and urination, insulin dysregulation, infertility, and lethargy. Involving a veterinarian early in the diagnosis and treatment of PPID will greatly enhance the horse's welfare and longevity. A veterinarian diagnoses PPID by observing symptoms and testing blood. Treatments for this disease include medicinal intervention and dietary changes. Early disease recognition and treatment make it more manageable.

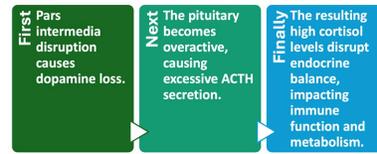


Figure 1. PPID Disease Process

Process

Disease Process

The equine pituitary gland is located at the base of the brain where it is separated by a sheet of dura mater (a thick, fibrous membrane that covers the brain and spinal cord). The pituitary gland is composed of four lobes. Each lobe produces hormones that regulate various bodily functions. In horses with PPID, the regulatory processes within the pars intermedia (one of the four lobes of the pituitary gland) become disrupted (Figure 1). The pars intermedia in horses affected by PPID loses dopamine input due to the degeneration of dopamine-producing neurons in the hypothalamus. Without adequate dopamine, which normally inhibits hormone production in the pars intermedia, the pituitary becomes overactive, leading to excessive secretion of adrenocorticotrophic hormone (ACTH). The increased ACTH stimulates the adrenal glands to produce higher levels of cortisol. This excess cortisol disrupts normal endocrine balance, impacting the horse's immune function and metabolism, which can affect the animal's ability to regulate insulin effectively. The primary cause of this altered regulation is often a benign tumor, such as a single large adenoma or multiple small adenomas on the pituitary gland.¹ While the exact cause of these adenomas remains unknown, oxidative stress has been suggested as a potential contributing factor.¹ Due to its nature, PPID is considered a degenerative disease and is most prevalent in older horses. Horses of any breed can be affected.

Symptoms

Symptoms of PPID are delayed shedding, increased urination, increased water intake, immunosuppression, weight loss, muscle wasting, laminitis, and lethargy.² Why horses with PPID are more prone to laminitis is not well understood, but it is believed that it could be linked to insulin dysregulation and sensitivity. Laminitis is also one of the most common symptoms that encourage a horse owner to take their animal to a veterinarian to receive a PPID diagnosis.² Increased cortisol and ACTH levels contribute to weight loss, muscle wasting, and immune system suppression, while decreased dopamine affects normal hair shedding, leading to a thick coat. Less commonly, PPID may cause infertility and neurological

issues. Horses with PPID often display multiple symptoms simultaneously, which may worsen as the disease advances.

Diagnostic Testing

Veterinarians can diagnose PPID through several different tests paired with symptom observation. These tests can include thyrotropin-releasing hormone (TRH) stimulation, domperidone response test, serum insulin concentration, and adrenocorticotrophic hormone (ACTH) stimulation.¹ The ACTH test in horses is one of the most common tests used to diagnose this illness. During this test, exogenous ACTH is administered to stimulate cortisol release from the adrenal gland, which is then measured in a blood sample. Elevated cortisol levels suggest an enlarged pituitary gland, helping to support a PPID diagnosis. Horses with PPID produce higher levels of ACTH than healthy horses, making this a key diagnostic tool.

Treatment for PPID includes medications prescribed by a veterinarian that act as dopamine agonists or serotonin antagonists. The most common medication is *pergolide mesylate*, which regulates dopamine levels, reducing the release of ACTH and helping manage PPID symptoms. These medications are most often required for the remainder of the horse's life. Studies have shown that pergolide treatment can lead to an 85% improvement in symptoms for some equines.³ Additional research has demonstrated that pergolide is effective at controlling ACTH secretion even during seasonal hormone fluctuations, making symptoms more manageable year-round.⁴



Dietary management is also crucial. Horses with PPID often experience insulin sensitivity issues, making it essential to limit starches and sugars in their diet. Their feeding plan should prioritize high-fiber, low-sugar foods like grass hays, while grains and concentrates should be minimized or eliminated.⁵ Each horse's dietary requirements will vary based on the severity of PPID and individual nutritional needs, so consulting a veterinarian or equine nutritionist is paramount to successful management.

Conclusion

PPID is caused by dysfunction in the equine pituitary gland. This illness often stems from benign tumors on the pars intermedia. These tumors cause reduced dopamine levels, increased cortisol, and increased ACTH in their system. Symptoms of this illness are increased hair growth, increased thirst and urination, lethargy, laminitis, and reduced healing ability. A veterinarian can diagnose PPID a hands-on exam as well as testing ACTH levels in the blood. Treatments for this disease include diet management and prescription medication. Diagnosing and managing this illness can increase the lifespan and welfare of the affected animal.

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