

Equine Endocrinology:

Pituitary *Pars Intermedia* Dysfunction (PPID)

What is PPID?

Pituitary *pars intermedia* dysfunction (PPID; equine Cushing's disease) is an endocrine disorder that occurs in over 20% of aged horses, ponies, and donkeys. Most animals are over 15 years old when diagnosed, but PPID can occur in younger horses. It is, rare in horses less than 10 years old. Horses and ponies of any breed may be affected.

How does PPID affect equines?

The pituitary gland, located at the base of the brain, plays a key role in regulating the body's hormones. Many metabolic and reproductive functions, as well as blood pressure and electrolyte balance are affected. Horses develop enlargement and benign tumors in a section of the pituitary gland known as the *pars intermedia*. While these tumors do not spread and rarely become large enough to cause neurological disease, they overproduce hormones that create an abnormal metabolic state.

One of the main hormones that increases is adrenocorticotrophic hormone (ACTH). This can cause many problems, including delayed shedding (ranging from a few long hairs to a distinctly long and wavy coat), muscle wasting (especially over the topline), weight loss, increased thirst and urination, either sweating or an abnormally dry coat, behavior changes, reproductive abnormalities, and frequent infections due to immune system suppression. While symptomatic treatment can address some signs (for example, a long hair coat can be managed by body clipping), the combined problems often lead to debilitation and reduce an older horse's quality of life. Affected animals struggle with dental disease, chronic sinus and skin infections, intestinal parasites, and general ill thrift. More severe metabolic problems may occur if they develop other disorders (such as colic, diarrhea, or pneumonia), complicating their treatment.

Many horses with PPID also have abnormal glucose (sugar) and fat metabolism; this is referred to as "insulin dysregulation." Even though some horses with PPID may appear thin, they often develop abnormal fat deposits over the neck crest, tail head, shoulders, and around the mammary glands or prepuce. Insulin dysregulation places horses with PPID at a higher risk of developing laminitis, which can be the most devastating complication of PPID.

Laminitis (founder) is a crippling disease caused by weakening of the tissues (laminae) anchoring the hoof wall to the underlying bone. The bone may rotate inside the hoof capsule, leading to chronic lameness, sometimes severe enough to warrant euthanasia. Horses with endocrine diseases can experience mild laminitis episodes that are not easily recognized, especially if the horses are not exercised regularly. Repeated mild laminitis episodes cause cumulative damage over time, leading to more severe lameness. Many horses with PPID already have signs of chronic laminitis at the time of initial diagnosis. This makes early diagnosis and screening for PPID important to health care for horses in their teens and beyond.

How is PPID diagnosed?

Horses with advanced PPID can have a classic appearance of a teddy bear with a long and curly hair coat, while animals with mild disease may look normal. However, laminitis may be slowly developing in animals with mild PPID. Screening tests help identify horses with early PPID before their overall health declines or laminitis develops.

Screening is often done by measuring ACTH, which is frequently elevated in animals with more advanced PPID. For horses with more subtle clinical signs, sometimes called "early" PPID, ACTH can remain normal and dynamic tests may be needed to uncover abnormal hormonal responses caused by PPID. These tests include the overnight dexamethasone suppression test and thyrotropin releasing hormone stimulation test which evaluate the pituitary gland's ability to respond to administration of these agents. Unfortunately, diagnostic tests have limitations and may still yield normal results in the early stages of PPID. Until more sensitive tests are developed, the decision to begin treatment is sometimes based on the presence of clinical signs alone.

Because many horses with PPID also have insulin dysregulation increasing the risk of laminitis, screening for PPID should also include testing for insulin dysregulation. Blood biochemistry analysis is also recommended as part of the overall geriatric wellness evaluation.

(Continued...)

*This fact sheet is provided by the Diagnostic Center for Population and Animal Health at the Michigan State University College of Veterinary Medicine as a public service. It is not intended to diagnose any disease. **Please contact your veterinary medical service provider if you have questions regarding this or any other veterinary medical issue.***

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How is PPID treated?

Pergolide mesylate is a drug that acts on receptors within the *pars intermedia* to suppress tissue enlargement and tumor growth. The only formulation currently approved by the Food and Drug Administration for the treatment of PPID in horses is Prascend® (Boehringer Ingelheim Vetmedica) and compounded formulations of pergolide are no longer recommended. Other drugs are occasionally used in combination with pergolide for cases that are not responding well to treatment. If your horse has subtle signs of PPID, but test results are normal, your veterinarian may remain suspicious of mild PPID and suggest administering pergolide as a trial for several months to see if your horse's condition improves with treatment.

Changes to diet may be needed, especially when insulin dysregulation is also present. Many older horses with PPID have difficulty maintaining weight, and it is essential for dental abnormalities to be addressed and nutritional needs to be met. Even with good dental care, elderly horses eventually wear their teeth to the point that hay can no longer be chewed. In these cases, pelleted senior feeds are effective for maintaining or gaining weight. If needed, fat supplements can be added to provide extra calories for horses that need to gain weight. For horses with insulin dysregulation, dietary sugar restriction is also needed and can be done by eliminating grain and limiting pasture access, especially during spring and fall when grass sugar content is higher. Some horses with PPID are "easy keepers" and suffer from obesity. For overweight horses, reducing calorie intake and increasing exercise helps promote weight loss and improve the metabolic state.

Wellness care including dental examinations, parasite control, and vaccination are essential to managing PPID. For horses that fail to shed, body clipping is helpful during warm weather. In horses with chronic laminitis, proper therapeutic farrier care and careful use of analgesic medications are vital to maintaining comfort and quality of life.

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