Frequently-Asked Questions: Equine Endocrine Testing

What are the endocrine test options for diagnosis of equine Cushings syndrome, or pituitary pars intermedia dysfunction (PPID)?

The clinical entity of PPID has been recognized for several decades and several aspects of endocrine dysfunction have been identified in affected horses. For routine clinical use, the test with the best published documentation of performance is the *overnight* dexamethasone suppression test. A baseline blood sample (for serum or EDTA plasma) is collected in late-afternoon or early evening followed by administration of dexamethasone (20 mg per 500 kg, IM). Post samples are collected 15 and 19 hours later.

In horses prone to laminitis, there may be reluctance to perform the dexamethasone suppression test. Many horses with PPID will maintain elevated concentrations of *endogenous ACTH*, thus measurement of this hormone can give added diagnostic insight. For this test, a random EDTA blood sample is collected, and the plasma transferred to a plastic tube as soon as possible after collection (preferably < 1 hour). ACTH is sensitive to degradation and the plasma should be frozen soon after collection. The specimen is shipped by overnight courier in an insulated container with frozen gel-packs. Interpretation of the result is made in conjunction with typical clinical signs and physical changes consistent with PPID.

Many horses with PPID will acquire altered glucose metabolism due to insulin resistance. Affected horses may have increased circulating concentrations of insulin as an indicator of the increased insulin secretion required to maintain normal blood glucose. Some horses will develop pronounced elevations of insulin accompanying high-normal or elevated serum concentrations of glucose. For practical clinical application, insight as to the presence of insulin resistance can be made by measurement of insulin in a baseline serum sample, with the specimen collected and harvested in a manner to have a good quality glucose result. The sample should not be collected within 4 hours after a meal composed of grain or other rapidly absorbed carbohydrate. Aside from the timing of sampling in reference to a grain meal, there are no restrictions to feeding of hay. Of the tests described in this section, the insulin assay is of the least sensitivity and specificity for diagnosis of PPID. Insulin resistance is also a component of the condition in horses currently referred to as ‘metabolic syndrome’.

What is ‘metabolic syndrome’ in the horse and how does it differ from Cushing’s syndrome or pituitary pars intermedia dysfunction (PPID)?

At the time of diagnosis, horses with PPID are >15 years of age, and usually older than 20 years. The typical clinical signs include hirsutism, loss of muscle, and accumulation of fat in the neck. Insulin resistance is common and some horses may develop diabetes mellitus. There is susceptibility for laminitis.

Horses with metabolic syndrome tend to be of middle-age (<15 years). The physical appearance is one of generalized or regional (cresty neck) obesity. There is increased risk for development of laminitis. Contributing factors include diets of a high glycemic index (lush new pasture or grain diet), and limited exercise. There are likely to be genetic factors with predisposition for glucose intolerance. When evaluated for endocrine dysfunction, these horses have insulin resistance but normal results for pituitary-adrenocortical function. It is possible that some of these horses are in early stages of PPID.