Pituitary Pars Intermedia Dysfunction

Pituitary pars intermedia dysfunction (PPID) occurs when oxidative stress reduces tonic dopaminergic inhibition of pars intermedia melanotropes, giving rise to hyperplasia, microadenomas, and macroadenomas. Detecting excessive endogenous plasma adrenocorticotropic hormone (ACTH) derived from the abnormal pars intermedia is the most common diagnostic test for PPID. Although comparable in performance to endogenous ACTH, the overnight dexamethasone suppression test (ODST) is more laborious and is therefore falling out of favor. Sensitivities of both endogenous ACTH and the ODST are acceptably high in equids with advanced PPID, but not in mild cases. A more sensitive option is the thyrotropin-releasing hormone (TRH) stimulation test (measuring ACTH response). Insulin dysregulation is common and is likely associated with an increased risk of laminitis and poorer long-term prognosis; testing for insulin dysregulation is recommended in all PPID cases.

Key Points
- Endogenous ACTH has supplanted endogenous cortisol measurement.
- All PPID tests may yield false positives in animals with severe systemic illness, stress, or pain.
- Rather than avoiding autumn (mid-July to mid-November) testing, exploit heightened seasonal responsiveness of the hypothalamic-pituitary-adrenal axis to increase diagnostic test sensitivity. Currently, seasonal reference ranges are only established for endogenous ACTH.

Endogenous ACTH concentration:
- Collect EDTA plasma at any time of day
- PPID is supported by ACTH concentration > 10 pmol/L (45 pg/mL)
- From mid-July to mid-November: > 22 pmol/L (100 pg/mL) supports PPID

Overnight dexamethasone suppression test:
- Collect baseline serum cortisol sample in the late afternoon
- Administer dexamethasone at 40 µg/kg IM (20 mg to a 500 kg horse)
- Collect serum cortisol sample(s) between 15 – 19 hours later
- Failure of cortisol suppression < 30 nmol/L supports PPID

Thyrotropin-releasing hormone stimulation test:
- Do not perform immediately after an oral sugar test due to blunting of pituitary ACTH responses to TRH
- Collect baseline EDTA plasma sample for ACTH measurement
- Administer 1.0 mg (total dose) of TRH IV
- Collect EDTA plasma ACTH sample exactly 10 minutes after TRH administration
- An ACTH concentration > 25 pmol/L (110 pg/mL) supports PPID

For more information, please contact the Endocrinology lab at 517. 353.1683 or visit our website at animalhealth.msu.edu.

Sample Submission Forms
Visit our website at animalhealth.msu.edu to access our most current submittal forms. Customized forms preprinted with your clinic information are also available at no cost via the Product Order Form.

Unbeatable Shipping
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Speak Directly to Experts
Our veterinary professionals are available for consultation and can help you interpret your test results to better manage the health of animals entrusted to you.

Get Results by Email and Online
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Expect Quality in Testing and Service
The MSU VDL is a leader in establishing technical guidelines for public veterinary diagnostic laboratories in the United States and maintains a quality assurance team dedicated to promoting accuracy and reliability.

The MSU VDL Advantage
The MSU VDL is a full-service veterinary diagnostic laboratory, fully accredited by the AAVLD for all species.

Customer Service Hours
Monday through Friday, 7:30 a.m. to 5:30 p.m. EST
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