PPID is a common endocrine disorder of older horses (usually 15 years and older). Degeneration of the dopaminergic neurons in the hypothalamus causes a loss of the normal tonic inhibition of the pars intermedia. This leads to overproduction of many peptides including pro-opio melanocortin, α-melanocyte-stimulating hormone, corticotrophin-like intermediate peptide and ACTH. Clinical signs of PPID include hirsutism, sweating, abnormal fat deposition, muscle wastage, laminitis, lethargy and polydipsia.

Diagnosis in advanced cases is often easy based on the presence of clinical signs. However, laboratory diagnosis is important for less advanced cases and to aid in monitoring the response to treatment.

The test options are explained in this fact sheet.

1 Basal plasma ACTH concentration

A single EDTA blood sample should be collected. This should ideally be done in the morning or evening before feeding, as this can increase ACTH concentration.

The sample should be chilled within 3 hours of collection. The plasma should then be separated (ideally by centrifugation) and then sent to the laboratory in chilled packaging. The plasma can be frozen if shipping is going to be delayed. It is very important that the whole blood is not frozen as this will lead to a spurious increase in ACTH.

An increased plasma ACTH concentration is indicative of PPID. The result must be compared to the seasonal reference range, as there is a normal rise in ACTH during the autumn months (August–October).

Sensitivity of this test in older horses is approximately 70% (specificity 81%). It is important that you interpret your test result in light of the clinical signs. False positive results are possible. The test is also not well validated in younger horses. The exact prevalence of the disease in younger horses (≤15 years old) is not known but it is less than the 20% prevalence in older horses. This makes the test's positive predictive value and accuracy much less in this age group. ACTH levels can also be increased in response to severe illness, pain or general anesthesia, which can make interpretation of test results difficult in a sick horse or one with recent, active laminitis.

What to do if you have an equivocal test result

There are two options:

i. Retest in 3–6 months time. If possible, you could consider testing in the autumn (between August – October). Horses with PPID often have a more exaggerated seasonal increase in ACTH than normal horses.

ii. Perform an alternative test - ideally a TRH stimulation test.
TRH Stimulation Test

When used in winter and spring, this is the most sensitive test that is currently available for the diagnosis of PPID. The test relies on an excessive pituitary response to the administration of Thyrotropin-releasing hormone (TRH) in horses with PPID when compared to normal horses.

| i. | Collect an EDTA sample for baseline measurement of ACTH. |
| ii. | Inject 1mg TRH intravenously. |
| iii. | Collect a second EDTA sample at 10 minutes (can also take a second sample at 30 minutes, but the first sample is usually the most useful). |
| iv. | The plasma should be handled as described in the ACTH section. |

An ACTH concentration of greater than 100pg/ml is considered positive for PPID.

| i. | The TRH comes in a vial of 25mg which should be stored in the refrigerator. This should be diluted with 5mls of sterile water to make a 5mg/ml solution. |
| ii. | 0.2mls (1mg) of this solution should be drawn up from the vial and diluted with a further 0.8mls of sterile water to give a total volume of 1ml. |
| iii. | This should be injected intravenously. |
| iv. | The stability of the diluted product is not known so it is recommended that any unused solution is discarded. |

Reported side effects include trembling, lip-smacking and flehmen-type behaviour.

ACTH responses to TRH stimulation are increased in the Autumn months. This test should be avoided between July and October.

Availability of TRH

Pharmaceutical grade TRH is not available on the veterinary or human markets in the UK. Chemical grade TRH can be purchased from: www.phoenixpeptide.com/catalog/product_info.php?products_id=1843

For detailed guidance on use of chemicals via the cascade see www.vmd.defra.gov.uk/pdf/vmgn/VMGNote13.pdf (Pages 6 and 7).
Dexamethasone Suppression Test

This test was previously considered the gold standard for the diagnosis of PPID. However, recent studies suggest that the test is much less reliable than the other tests previously discussed. The test is also unreliable during the Autumn months and requires the administration of corticosteroids which can be a concern in horses judged to be at high risk for the development of laminitis.

i. Collect a baseline serum sample for measurement of cortisol.

ii. Inject 0.04mg/kg dexamethasone IV or IM.

iii. Collect a second serum sample for measurement of cortisol 19–24 hours later.

Normal horses show a suppression of cortisol to <10% of baseline levels. Horses with PPID fail to show suppression of cortisol values and have a high serum cortisol following dexamethasone administration. A cut-off value of 27nmol/L is usually used.

Other tests that may be useful in cases of PPID.

Routine haematology and biochemistry may be useful as a general healthy check but cannot be relied upon to make a diagnosis of PPID.

Measurement of fasting insulin and glucose can be useful as indicators of concurrent insulin dysregulation. Serum and fluoride oxalate samples should be taken after an overnight fast.

Dynamic endocrine tests can also be useful (see insulin dysregulation).


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