

NWL NEWS

The Newsletter of NationWide Laboratories Ltd

Summer 2006

Welcome to the NationWide Laboratories quarterly newsletter.

This will contain latest news and updates about our laboratory, short refresher articles, quizzes and case histories. There will also be a letters section if any of you would like to express opinions about a subject or any interesting facts that you would like to share with everyone!

Please contact the Editor if there is a particular subject that you would like to see in the newsletter.

Refresher... Hyperadrenocorticism (HAC)

Endocrine Tests:

These should only be performed in animals showing clinical signs consistent with HAC. Single basal cortisol are of no value in the diagnosis of HAC. This can fluctuate widely in the normal dog, cases with other illness and HAC cases.

ACTH stimulation test and the **low dose dexamethasone suppression test** are the two tests of choice.

Approximately 80% of all dogs with HAC are positive on the ACTH stimulation test. Approximately 90-95% are positive on the LDDST.

The sensitivity of ACTH stimulation test is much lower in diagnosing adrenal dependent disease (60%). Some dogs with functional adrenal tumours can give normal results in both tests.

Testing a population with animals with non-adrenal illness and clinical signs not consistent with HAC will result in a higher percentage of false positive results in both tests.

False positive results can be seen with Diabetes Mellitus (DM), pyometra and renal disease.

When cases have clinical signs consistent with HAC and equivocal or negative test results then it is advised that investigation for the presence of other endocrine disease be undertaken e.g. hypothyroidism.

In cases with confirmed DM that are difficult to stabilise, a possibility of underlying HAC exists (approximately 10% of HAC cases develop DM). It is advised that the DM is stabilised as far as possible before testing for HAC since a higher percentage of false positives with occur in testing unstable DM cases.

ACTH Stimulation Test Interpretation:

Result	Pre ACTH sample cortisol nmol/l	Post ACTH sample cortisol nmol/l	Comment
Normal	20-250	200-450	
Normal (equivocal)	20-250	450-660	Indicates abnormal adrenal cortex but the cause is not clear e.g. stress, HAC
HAC	20 – 250 (often higher with adrenal dependent HAC)	> 660	Assumed to be positive in cases where clinical signs are consistent.
Hypoadrenocorticism/iatrogenic HAC	Low	Low (little stimulation)	

Advantages:

- *Simple quick and specific;*
- *Best screening test for distinguishing spontaneous from iatrogenic HAC;*
- *Provides baseline information for monitoring mitotane and trilostane therapy.*

Disadvantages:

- *Minimal value in differentiating pituitary (PD) from adrenal (AD) HAC;*
- *False negative results (ie normal response) may occur, especially in AD-HAC;*
- *False positive results (ie exaggerated response) may occur with chronic stress due to non-adrenal illness.*

Low Dose Dexamethasone Suppression test:

Interpretation:

Normal: >50% suppression of cortisol concentration at three hours and suppress to <30nmol/l at eight hours. Cases where the dexamethasone fails to suppress circulating cortisol to < 40nmol/l at eight hours in a dog with compatible clinical signs is POSITIVE for HAC.

PD-HAC: cortisol is suppressed normally or near normally (to <40nmol/l) at the three hour sample but the eight hour sample is >40nmol/l. PD or AD-HAC – failure to suppress at both three and eight hour samples.

NB: cases where there is a pattern of low cortisol that is not suppressed throughout the test should prompt further investigation for an adrenal tumour since some adrenal tumours may release cortisol precursors.

Advantages:

- *More sensitive than the ACTH stimulation test in confirming HAC;*
- *May confirm the diagnosis of PD-HAC.*

Disadvantages:

- *Not as specific as the ACTH stimulation test ie more likely to produce false positives, especially if performed in a stressful environment. In chronically ill animals that DO NOT have hyperadrenocorticism it can be (falsely) positive in up to 56% cases;*
- *Takes longer to perform than the ACTH stimulation test;*
- *Does not provide pre-treatment information that may be used in monitoring the effects of therapy.*

Refresher... Cytology

Diagnostic cytology is most frequently used in practice to evaluate cutaneous and subcutaneous masses, enlarged lymph nodes, body cavity fluids, synovial fluid, respiratory tract and prostatic washes.

Advantages:

- Quick, easy and inexpensive;
- No general anaesthetic (or sedation) usually required;
- Rapid processing and results;
- Less invasive than biopsy thus fewer complications.

Disadvantages:

- Potential complications are haemorrhage, sepsis, bacteraemia, tumour seeding, pneumothorax (ALL RARE);
- May not be diagnostic.

Diagnostic Accuracy:

1. Quality of the sample collected;
2. Processing of the sample;
3. Organ or type of disease/tumour being investigated;
4. Experience and training of the cytopathologist.

1. and 2. are affected by the operator experience. E.g. lymph nodes exfoliate easily but excessive pressure during harvesting, transferring and making a smear on the slide can cause significant cell destruction particularly if many neoplastic cells are present since these have more fragile cell membranes.

3. In contrast to lymph nodes, some tissues like bone, kidney are difficult to obtaining diagnostic samples from. Firm masses e.g. spindle cell tumours often can result in non-diagnostic samples due to cells being bound in matrix material and few cells obtained. Ultra sound guidance, particularly of internal masses or focal lesions within organs may be expected to increase the likelihood of obtaining a diagnostic cytological aspirate but recent work by Wang et al. (2004) does not support this.

Limitation of diagnostic cytology:

- Small mobile or very firm masses frequently have a low yield of cells on cytological aspirate;
- Mast cells are usually diagnosed by cytological aspirate but Histology is usually advised for grading of these neoplasms;
- Poorly differentiated tumours, especially of mesenchymal origin, nearly always require further investigation with histology to identify tissue type;
- Mammary masses are often complicated and a mixture of more than one tissue type requiring histology to allow further identification of tissues present and differentiate hyperplastic, benign and malignant tumours;
- May not be representative of the lesion e.g. obese animals may have significant perilesional fat or large masses may have significant areas of necrosis particularly in central regions. Ulcerated lesions and those where significant infection and or inflammation is present often require aspirate from the deeper part of the lesion for a representative sample.

Reference: Wang KW, Panciera DL, Al-Rukibat RK and Radi ZA (2004) Accuracy of ultrasound-guided fine-needle aspiration of the liver and cytological findings in dogs and cats: 97 cases (1990-2000). J Am Vet Med Assoc **224**, 75-78.

Case Question...

DETAILS:

Case 1 - 15 year old DSH MN cat

HISTORY:

Progressive weight loss, polyphagia, tachycardia (>240 bpm)

DIAGNOSTIC TESTS:

Haematology: within normal limits

Biochemistry:

Parameter	value	Normal range
ALP iu/l	126	(0 - 55)
ALT iu/l	112	(30 - 60)
Bilirubin umol/l	1.0	(0 - 4)
Total protein g/l	83	(55 - 78)
Albumin g/l	34	(26 - 40)
Globulin g/l	49	(19 - 48)
Alb: Glob ratio	0.69: 1	(0.53 - 1.36)
Urea mmol/l	9.8	(3.5 - 8.0)
Creatinine mmol/l	102	(40 - 180)
Calcium mmol/l	2.39	(2 - 2.8)
Phosphorus mmol/l	1.7	(0.81 - 1.61 > 2 years)
Glucose mmol/l	4.2	(4.3 - 6.6 Fasting)
Sodium mmol/l	160	(141 - 155)
Potassium mmol/l	4.5	(3.5 - 5.5)

QUESTIONS:

What are the differential diagnoses?

What further tests would be advised?

Answer: next issue

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Coming up next issue...

- Drug monitoring for anticonvulsants
- Infectious diseases
- Case question answers
- NWLabs update