

Testing for equine metabolic syndrome

LISA HULME-MOIR

Horses with equine metabolic syndrome (EMS) are at an increased risk of developing laminitis.

Classically we think of the cresty-necked, overweight horse or pony that can live on the smell of an oily rag. However not every overweight horse has EMS and occasionally some horses with normal body condition may have EMS (so called lean EMS).

Laboratory testing is therefore beneficial to confirm the diagnosis and identify individuals that would benefit from the introduction of management strategies to reduce the risk of laminitis. Testing also provides prognostic information and can be used to monitor the response to any interventions.

Horses with EMS display one or a combination of hyperinsulinaemia, an excessive insulin response to ingested carbohydrate or tissue resistance to insulin. Testing strategies are therefore directed at either identifying hyperinsulinaemia or tissue insulin resistance.

Resting insulin

Previously fasting had been recommended prior to testing basal insulin concentrations. This was to try to eliminate the variation that might occur due to dietary factors and the time since feeding. Fasting insulin measurement however is no longer recommended due to its low sensitivity (few EMS horses have fasting hyperinsulinaemia) and the potential for fasting itself to induce insulin resistance in clinically normal horses. Measurement of basal insulin in a non-fasted

horse however can be useful to screen for resting hyperinsulinaemia and assess the risk of current diet. Testing is generally recommended two hours after the most glycaemic intake occurs. This test has low sensitivity but is highly specific for EMS.

Oral sugar test/Oral glucose test

To increase the sensitivity of detecting inappropriate hyperinsulinaemia, insulin measurement may be performed after feeding a sugar-rich meal. This can be achieved by administering a dose of Karo Light Corn syrup ([Oral sugar test](#)) or glucose powder mixed with a small amount of chaff ([Oral glucose challenge test](#)).*

Both tests have their pluses and minuses, and there have been recent changes in the recommended dose of corn syrup for the oral sugar test, which has improved its reliability (increased from 15mL/100kg to 45mL/100 kg). As the sugar content of corn syrup can vary by brand, it is important that the Karo Light Corn Syrup is used. With both tests, measurement of baseline insulin is not strictly necessary so only one vet visit to obtain the post-feed blood sample is needed.

Tests for insulin resistance

Most tests designed to assess tissue insulin resistance are complicated and rarely performed outside of the research setting. The most common test used in clinical practice is the 2-step insulin response test (also known as Insulin tolerance test). The reported advantages of these tests are that they display a more consistent response to management and dietary changes than oral sugar/glucose tests and occasional horses

with EMS may display tissue insulin resistance but not hyperinsulinaemia. Disadvantages include the risk of hypoglycaemia after injection of the insulin and the questioned repeatability of the 2-step insulin response test.

Finally, regardless of the test you use, it is important to remember that normal physiological responses can overlap with pathological responses. The effect of current diet should be considered and stress minimised prior to testing e.g. avoid testing during acute laminitic episodes, when concurrent illness is present or after transportation, heavy exercise, excessive starvation or any significant changes in management or diet.

For the latest recommendations and a full discussion of testing for EMS, see the links and references provided below.

- Bertin FR, de Laat MA. The diagnosis of equine insulin dysregulation. *Equine Vet Journal*. 49:570-576, 2017.
- [Equine endocrinology group](#)
- Liphook Equine Hospital: [Notes for interpretation of lab results](#).
- Jocelyn NA, Harris PA, Menzies-Gow NJ. Effect of varying the dose of corn syrup on the insulin and glucose response to the oral sugar test. *Equine Vet Journal*. 50:836-841, 2018.

* Protocols for both tests can be found in the [Veterinary Handbook on our website](#).

Courier networks under immense pressure

With Omicron having an increasing impact around the country, including increased numbers of people now self-isolating, courier services are being severely impacted.

What does this mean for you?

> Delivery times for your samples to get our laboratories could be longer, so testing and receipt of results will consequently be delayed.

> Delivery time for samples moving between our laboratories or to subcontractors for special testing could be longer, so testing turn-around-times could be longer than normal.

> The delivery time for consumable items you have ordered via our online shop could be

longer. We recommend you plan well ahead and keep stock on hand.

NZ Couriers has created an online "[Network Status Framework](#)" where you can see at a glance the status of the courier network in your region. A number of regions are currently at high pressure or critical.

Critical regions currently include Auckland, North Harbour and Hamilton.

High pressure regions currently include Whangarei, Wellington, Greymouth, Christchurch, Inter-island air and road.

[View NZ Couriers network status here](#)

We will notify you of any urgent updates via email, plus they will also be posted on our

website and Facebook page.

So please be patient. These wait times are outside of our control and we need to be kind to our couriers who are doing an amazing job in unprecedented times.



Bovine disease surveillance report

MPI has developed a new bovine disease surveillance report to help veterinarians better understand disease patterns at both the regional and national levels.

These reports utilise data collected as part of Biosecurity New Zealand's (BNZ) Animal Health Surveillance Programme, which collects anonymised data on all sick bovine cases seen by the veterinary diagnostic

laboratories in New Zealand.

These new reports present the past three years presenting signs and diagnoses data for each quarter (Jan-Mar, Apr-Jun, Jul-Sept, Oct-Dec), this may help veterinarians understand what diseases to expect in the same quarter of the current year, assuming similar climatic conditions. Additionally, it may assist in identifying emerging diseases in a timely way.

Improving NZ's biosecurity system including timely detection of exotic or emerging disease

The endemic disease reports have two parts:

> Graphs showing presenting signs and corresponding diagnoses for the upcoming quarter for the past three

years, both for each region and nationally.

The graphics demonstrate the frequency of each presenting sign for the quarter and then, for the three most frequently reported presenting signs, the aetiological diagnoses that were achieved for each presenting sign.

> Bovine disease narratives from Surveillance magazine for the upcoming quarter from the previous year (nationally and regionally) - these are pathologist reports from the veterinary laboratory network.

As an example, the upcoming 'Quarter 2' National Report (reporting data for the April-June quarter) can be [found here](#).

If you would like to receive these reports via email please [subscribe here](#) by completing your details.



An uncommon finding

SANDY WELTAN & CRISTINA GANS

Clinical history

Bella, a 10-year-old female entire Shih Tzu presented for evaluation of abdominal distension. Aside from this, Bella was well at home, with no changes in appetite, water intake, urination or defaecation noted. Fourteen months prior, Bella had a cystic mammary lump surgically removed. Unfortunately, histology had not been performed for this mass.

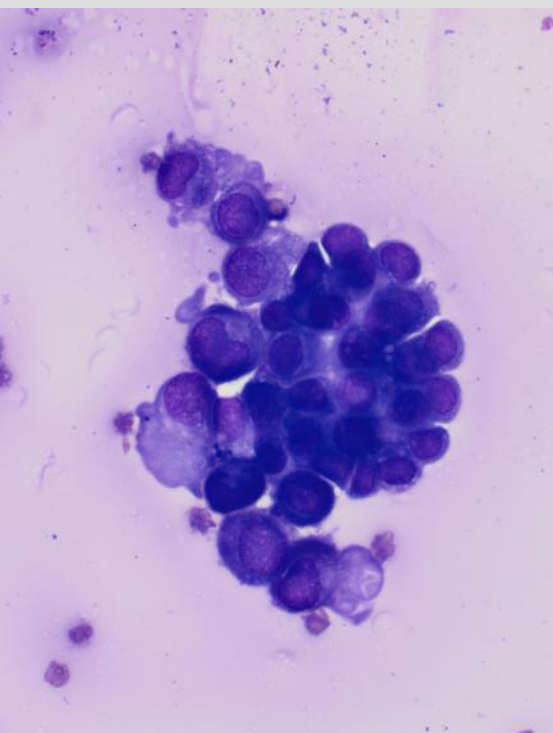
On examination, marked abdominal distension was present. Ultrasound scan demonstrated large volume abdominal effusion, abnormal appearance to both ovaries bilaterally, cystic lesions throughout the uterine wall, and occasional nodular appearance to the peritoneal fat. Three view thoracic radiographs did not show any overt metastatic disease.

Cytology

A sample of the peritoneal fluid was submitted to the laboratory. Direct and cyto-centrifuged smears were made from the fluid.

The cellularity was high, even in the direct smears which contained moderate numbers of erythrocytes and clusters of hyperplastic mesothelial cells, as well as clusters of other atypical cells which were present in small and larger groups. They were loosely cohesive and showed marked anisocytosis and anisokaryosis with a high nucleus to

Figure 1. Clusters of cells observed on cytology in peritoneal fluid.



cytoplasm ratio. The cytoplasm was moderately basophilic with irregular cell borders with membranous projections. The nuclei were oval and contained coarse chromatin with large but indistinct nucleoli. (Figure 1).

Background cells consisted of lymphocytes, non-degenerate neutrophils and macrophages, many of which were erythrophagocytic and cytophagic. This suggested a neoplastic effusion (possible carcinomatosis).

Histology

Bella underwent ovariohysterectomy with uterus and ovaries submitted for histology, along with biopsy of nodular peritoneal fat. On histopathological examination, both ovaries displayed an infiltrative neoplasm consistent with an ovarian carcinoma (Figure 2). The presence of neoplastic emboli was evident in the lymphatics in these sections.

The peritoneal fat did not show any evidence of neoplasia. There was cystic endometrial hyperplasia and adenomyosis in the uterus which is a common incidental finding in older intact female dogs.

Follow-up

The abdominal effusion completely resolved post-ovariohysterectomy, and to date (five weeks later), there has been no recurrence. Bella's owner has elected not to pursue any follow up oncology treatments.

Discussion

Bilateral ovarian carcinomas have been reported in dogs, although this is less

common than unilateral carcinomas. Several studies have reported regional or localised metastasis (including peritoneal carcinomatosis).

Ovarian carcinoma is common in humans, but uncommon in dogs.

Thanks to Julia Giles and Holly Smith of Totally Vets Manawatu for providing the clinical information for this case.

References:

- Tumors in Domestic Animals.* John Wiley & Sons, Inc. Fifth Edition. 2017.
- Patnaik, A. K., and P. G. Greenlee. Canine ovarian neoplasms: a clinicopathologic study of 71 cases, including histology of 12 granulosa cell tumors. *Vet Path.* 24:509-514, 1987.
- Sforna M, Brachelente C, Lepri E, Mechelli L. Canine Ovarian Tumours: a retrospective study of 49 cases. *Vet Res Commun* 27 Suppl 1: 359-361, 2003
- Solano-Gallego, L. and C. Masserdotti, Reproductive System, in *Canine and Feline Cytology.* R.E. Raskin and D.J. Meyer (eds). *A Colour Atlas and Interpretation Guide,* Pp. 313-352, Elsevier, St Louis, Missouri, 2016.

Figure 2. Infiltrative neoplasm consistent with an ovarian carcinoma. H&E stain.

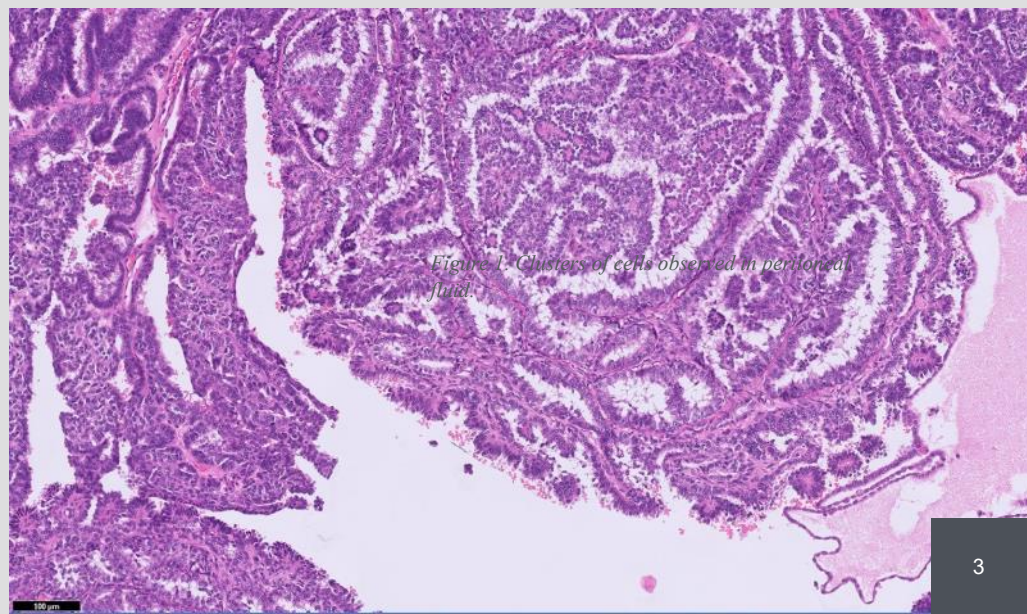


Figure 1. Clusters of cells observed in peritoneal fluid.

Consumable of the month

Do you order laboratory consumable items from us online or via our order form? If you need just one blood tube or swab, or enough for a herd, we've got you covered.

Our featured consumable item this month are **Gram's stain reagents**.

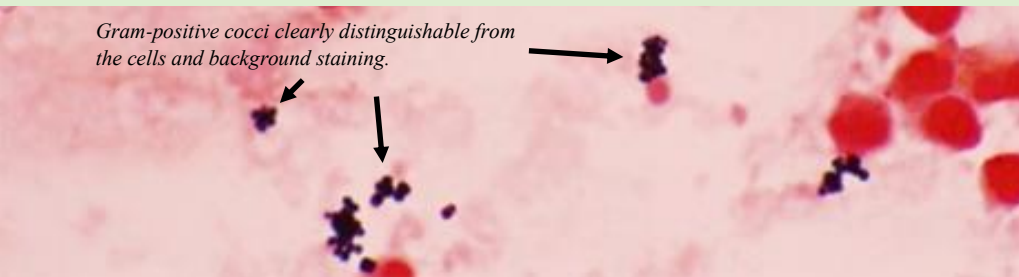
If you already do staining in-clinic for cytology or haematology, why not take it up a notch and add Gram' staining too? Unlike "Diff Quik" which is a stain for cells, Gram's stain is designed for

bacteria. It allows you to see the bacteria more clearly against cellular backgrounds, and more importantly, it provides differentiation between Gram-positive and negative organisms.

Full instructions are provided in [this 'How to' guide](#) which can be found on our website.

Note: *There will be no giveaway on Facebook this month, as sending out prizes would place unnecessary strain on the courier network.*

Gram-positive cocci clearly distinguishable from the cells and background staining.



For a laugh!

If you follow us on Facebook, you'll be familiar with our regular Friday slot. Feel free to message us on FB with any funnies you'd like us to post.

Here's our most popular funny from February. Cats, gotta love them!

... and if you don't follow us, [head over](#) and hit the LIKE button now!

For a more organized home, make sure everything has a place



In brief:

Facial eczema spore counts are very high in most areas. [View real-time spore counts here.](#)



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