Vetnostics Newsletter

December 2018

Season's Greetings from QML Vetnostics

The pathologists and staff at QML Pathology Vetnostics wish you a joyous festive season, filled with peace and good health.

Blood Film Evaluation: A Vet Board Caution

The most recent newsletter from the Veterinary Surgeon's Board of WA highlighted a recent case that came before the Board:

"In a recent case before the Board a veterinary surgeon failed to perform a blood smear to determine the cause of in house haematology analyser results which showed a "high white cell count" and consequently missed diagnosing that the animal was critically ill.

The Board cautions veterinary surgeons against relying solely on numerical data when evaluating an animal's blood and encourages the performance of routine blood smears in conjunction with in house haematology analysers."

This is a timely reminder that numerical results from a haematology analyser should never be a substitute for blood film assessment. Blood film assessment is a vital component of a complete blood count and should be considered manditory in every haematology analysis.

It allows for:

1. Cross-checking of instrument data (i.e. assessing red and white cell density and platelet numbers to confirm cytopaenias or leukocytosis, and confirming the accuracy of the differential WBC count)
2. Detection of abnormalities that analysers either cannot detect, or cannot reliably detect, which may provide crucial diagnostic and/or prognostic clues. This includes presence of;
   - Agglutination
   - Toxic change
   - Immature or dysplastic WBCs
   - Neoplastic cells (mast cells, circulating neoplastic lymphocytes, blasts)
   - Erythrocyte morphological abnormalities (polychromasia, microcytes, hypochromic cells, schistocytes, spherocytes, Heinz bodies, acanthocytes, eccentrocytes, etc)
   - Haemoparasites (heartworm microfilariae, haemotropic Mycoplasma sp., Babesia sp.)

QML Vetnostics automatically perform blood film examination on ALL haematology submissions, including non-intepreted profile requests.

Measurement of urine protein

Urinalysis is an essential component of the minimum database for patients presenting with urinary disease.

A number of methodologies can be used to detect proteinuria. The most common method is by **urine dipstick**. Protein detection on a dipstick is based on the ability of amino groups in proteins to bind with and alter the colour of acid-base indicators on the dipstick pad. This test is most sensitive to albumin, which has more free amino groups than other proteins such as globulins, haemoglobin and Bence Jones proteins.

The dipstick protein test is not affected by urine turbidity, but can be **altered by urine pH, with highly alkaline urine potentially causing false positive protein results.** Erythrocytes, WBC and seminal fluid can also increase urine protein concentration.

Proteinuria identified by dipstick analysis is significantly affected by the concentration of the urine sample. The **urine protein:creatinine ratio** (UPC) removes the variable of concentration and helps to clarify whether the amount of urine protein is clinically significant. The UPC also removes the need for a 24 hour urine sample to measure urine protein excretion; a difficult task in veterinary species. The UPC is determined by dividing the urine protein concentration by the creatinine concentration to create a unitless number in non-azotaemic animals. UPC <0.5 is considered normal, and UPC > 1.0 is abnormal.

UPC can also be used to sub-stage cases of chronic kidney disease (CKD), typically following identification of proteinuria / questionable proteinuria and demonstration of inactive sediment via urinalysis (as per IRIS guidelines*);
UPC < 0.2: Non-proteinuric.
UPC 0.2 – 0.4 (cats), 0.2 – 0.5 (dogs): Borderline proteinuric.
UPC > 0.4 (cats), > 0.5 dogs): Proteinuric.

Most patients with a UPC > 5.0 have primary glomerular disease, however the UPC must be interpreted in light of the wet microscopy results.

A UPC should only be performed on urine samples with persistent evidence of excess protein, no evidence of cystitis (inactive sediment) and in light of the urine specific gravity (USG). There is no additional value in performing a UPC in an animal with USG of 1.035 and trace protein on the dipstick, and mild proteinuria that is transient is of little clinical significance. Inflammatory conditions in the urinary tract will increase protein and any proteinuria may therefore be post-glomerular in origin.

Urine protein electrophoresis can be used to screen for Bence Jones proteins. These proteins are monoclonal globulin proteins or immunoglobulin light chains that form a narrow spike on an electrophoretogram in patients with multiple myeloma. Urine protein electrophoresis is warranted in patients with a serum monoclonal gammopathy.

Urine protein concentration is not affected by storage, and is stable at both room temperature and 4 °C for up to 5 days. Note that refrigeration of urine samples is recommended to help preserve the sediment and prevent bacterial overgrowth during storage.

(Adapted from Vetpath WA, January 2018 Newsletter).

*Reference: International Renal Interest Society (IRIS) http://www.iris-kidney.com/guidelines/.

1300 VET QML

Please ONLY call your local courier/laboratory number to request sample collections or urgent stores/supplies.

For all other enquiries, please call 1300 VET QML.