

Vetpath is a specialist veterinary laboratory dedicated to providing our clients with the finest laboratory diagnostic service. A team of veterinary pathologists and medical scientists with extensive experience in veterinary diagnostic pathology forms the core of the Vetpath team.

VN News

MARCH 2016

Assessment of urine SG in diabetic patients

Urine specific gravity is an essential part of a minimum diagnostic database. However, how does diabetes mellitus and glucosuria affect urine SG?

The specific gravity of a fluid is the ratio of the solution's weight to the weight of an equal volume of water. The refractive index of urine is an estimate of the urine SG, and is dependent on the solute concentration, chemical composition of the solute and temperature. Suspended particles (eg cells, crystals and casts) do not refract light and therefore will not alter the specific gravity, however they do interfere with light transmission and can therefore make the urine SG more difficult to read.



Sodium, chloride and urea account for most of the osmotic activity in urine. But, how much does glucose contribute to urine SG? Does glucosuria falsely increase urine SG?

A short paper presented at last year's annual conference of the American College of Veterinary Internal Medicine indicated that in fact **glucose does not contribute significantly to urine SG**. The presenter had performed a small study where urine samples with different specific gravities were spiked with glucose. There were some small, clinically insignificant changes in urine SG when glucose was added to dilute urine; however this affect was diminished in more concentrated urine samples. All changes in urine SG were clinically insignificant, indicating that glucose does not affect urine specific gravity.

The study findings indicate that a concentrated urine specific gravity confirms the presence of adequate renal concentrating ability and is not due to interference by glucose. Inadequately concentrated urine specific gravity in a diabetic patient is a little more difficult to interpret. Renal concentrating ability may be partially impaired due to solute diuresis or decreased medullary tonicity. Therefore, renal concentrating ability should be assessed carefully in patients with inadequately concentrated urine SG and glucosuria.

What's your diagnosis?



Answer over the page...

Babesia canis!

Babesia canis is a protozoan that infects erythrocytes of dogs and other canids. *B. canis vogeli* is the



subspecies present in Australia and is transmitted by the brown dog tick (*Rhipicephalus sanguineus*). These ticks are predominantly found in warm climates and therefore most cases of babesiosis are found in the northern areas of Australia. The ticks must be attached to the dog for several days before infection occurs.



Figure: The brown dog tick (*Rhipicephalus sanguineus*).

In contrast to *B. canis rossii* and *B. canis canis*, infection with *B. canis vogeli* typically causes mild disease. Moderate to severe thrombocytopenia is almost always present, while anaemia is rare (unless there is a concurrent condition). Diagnosis of babesiosis is often made by identification of intra-erythrocytic piroplasms on a blood smear. Serological and PCR tests are also available.

Babesiosis is a consideration in patients living in the northern part of Australia, or who have recently travelled. There was also a recent case in a dog that had been kenneled with a dog from further north. Another reason to always evaluate a blood smear!

Reference: Irwin PJ. Canine Babesiosis. *Vet Clin Small Anim* 40 (2010) 1141–1156

Microbiology FAQ

Q. How long does a culture take?

A. This depends on the organism. Generally, most bacteria will grow within 24 hours and sensitivities are usually reported within 48 hours. Acid-fast bacteria and fungi are cultured for 4 weeks.

Q. Can I ask for specific antibiotics to be included in the sensitivity panel?

A. Yes. Just write the antibiotic you wish to be included on the submission form. This may require removal of one of the other antibiotics from the sensitivity set. An additional fee will be applied if you require further antibiotic(s) to be tested after the initial sensitivities have been reported. Note that additional antibiotics can only be added if appropriate for the organism cultured.

Q. Can I hold the culture pending the cytology or histopathology results?

A. You can add on a culture after you receive the results of cytological evaluation. This is not possible with histopathology as the culture sample will no longer be viable by the time you receive the histopathology report.

Q. When is culture indicated?

A. +/- C&S is a common request; particularly for urine samples. A culture will proceed if an increased number of neutrophils or bacteria are observed on the wet microscopy (ie over 5 WBC/uL).

Don't forget to provide a clinical history!

Clinical history and location of aspirated or biopsied lesions are an important part of the submission process. Just taking a moment to write a few words on the submission form can allow us to provide a more thorough and relevant interpretation for the abnormalities we identify. Help us to help you!



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