Validation of a point-of-care haemoglobin meter (Avie Total Hb™) for canine and feline blood samples

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BACKGROUND

In veterinary medicine, PCV (packed cell volume) is the most common clinical test used to estimate the oxygen carrying capacity of blood and detect anaemia. However, PCV determination requires the use of a centrifuge, generates sharp waste and takes several minutes. In human medicine, haemoglobin (Hb) measurement is considered superior to PCV for monitoring anaemia because of the availability of international reference standard preparations. Several point-of-care (POC) haemoglobin meters are now commonly used in medical practice. Validation of these POC instruments for veterinary practice is needed to ensure the accuracy of results.

OBJECTIVE

To validate a POC device (Avie Total Hb™) for canine and feline blood samples.

METHODS

The meter was first tested for precision and reproducibility by

measuring 5 samples (3 dogs and 2 cats) with varying Hb values 5 times each. The effect of storage on samples was tested by measuring 4 samples (3 dogs and 1 cat) stored at 4°C every day for up to 6 days. Haemoglobin concentration was then measured using the POC meter and a reference laboratory analyser (Siemens Advia 120) in a total of 81 blood samples from 65 dogs and 57 samples from 41 cats, stored for a maximum of 5 days. Co-efficients of variation were calculated for the precision and storage analyses. Pearson correlation coefficients were calculated and Bland Altman analysis was used to compare the 2 methods of measuring haemoglobin.

RESULTS

The meter was found to be easy to use and faster than a traditional PCV measurement by a range of operators. Precision and stability studies showed acceptable coefficients of variation for within-batch precision and for storage. Coefficient of correlation showed a high degree of correlation between the 2 methods ($r = 0.935$ for canine samples, $r = 0.95$ for feline samples, $p < 0.001$ for both). Bland Altman analysis revealed good absolute agreement with the laboratory analyser with estimated bias of -0.8 g/dl for canine samples and -0.5 g/dl for feline samples.

CONCLUSION

Results suggest that Avie Total Hb™ device had good precision and reliability when compared to the standard laboratory analyser for measurement of haemoglobin in canine and feline blood samples. Samples could be measured for up to 5 days without significant deterioration. The Avie Total Hb™ POC meter is a safer, faster and reliable alternative to traditional PCV measurement.

Serum cardiac troponin I concentrations decrease following treatment of primary immune mediated haemolytic anaemia

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Serum cardiac troponin I concentrations (cTnI) have been measured in many species to non-invasively assess for the presence of myocardial damage. The measurement of cTnI in dogs with a range of non-primary cardiac illnesses has

revealed that cardiac myocyte damage is commonplace. Increased serum cTnI concentrations have been demonstrated in dogs with Ehrlichia and Babesia infections and in anaemic cats. Serum cardiac troponin I concentrations have also recently been demonstrated to be increased in dogs with primary immune mediated haemolytic anaemia (IMHA) at the point of diagnosis.

However, it remains unknown whether the increase in serum cTnI concentrations and therefore myocyte damage is sustained or responds to treatments or whether the increase in cTnI concentrations is due to dogs with IMHA having a high incidence of concurrent primary cardiac disease.

OBJECTIVES

To investigate the response of serum cTnI concentrations after treatment, in dogs with primary IMHA. We hypothesised that serum cTnI concentrations would decrease with improvement of anaemia in these dogs.

METHODS

A haematology profile was performed and serum cTnI concentrations were measured in 19 dogs with primary immune mediated haemolytic anaemia before and after treatment.

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