Measurement of prothrombin time (PT) and activated partial thromboplastin time (aPTT) in dogs using a point-of-care coagulometer

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INTRODUCTION

The CoagVET (Diagon) is a point-of-care coagulometer that is available for measuring clotting times in dogs, cats and horses. The aim of this study was to determine imprecision and analytical acceptability of the CoagVET for measuring PT (seconds) and aPTT (seconds) in dogs and to compare the results generated by this instrument to those obtained by established manual methods.

METHOD

Imprecision was determined by inter- and intra-assay repeatability using manufacturer-supplied quality control materials (normal; QCM I, abnormal/prolonged: QCM II). Coefficients of variation (CV%) were calculated following performance of

tests every day for 10 days (interday) and 13 times on the same day (intraday). Analytical quality was assessed using the requirements used in human studies (target value $\pm$ 15%). PT and aPTT were also measured in citrated plasma samples from 19 clinical cases using the CoagVET and manual methods. All measurements were performed in duplicate. Spearman's correlation (r_s) and Bland-Altman analysis were employed for method comparison.

RESULTS

See Table 1.

The correlation between the CoagVET (PT_{RANGE} = 6.9–60 secs, aPTT_{RANGE} = 12–113 secs) and manual method results (PT_{RANGE} = 6–31.7 secs, aPTT_{RANGE} = 9.3–60 secs) was high for PT (r_s =0.78) and aPTT (r_s =0.84). There were wide 95% confidence intervals; PT 0.50–0.91% and aPTT 0.62–0.94%. Agreement between the two methods identified a positive bias (PT=37.6, aPTT=68.1), wide limits of agreement (PT=–4 to 79, aPTT=9.9 to 126) and the presence of outliers for PT (n=..) and aPTT (n=..).

CONCLUSION

The precision of the CoagVET is high when the PT and aPTT results are within normal limits but lower when are prolonged. The agreement studies indicate that results generated by the two methods cannot be used interchangeably and that values should be interpreted using method specific reference intervals. More clinical cases are recruited at present for improving the validity of the comparison studies and completing the clinical evaluation of the coagulometer.

	PT		aPTT	
	QCM I (target: 11.4 secs)	QCM II (target: 20 secs)	QCM I (target: 36.5 secs)	QCM II (target: 58.5 secs)
Interday CV (%)	4.2	3.1	3.5	14.1
Intraday CV (%)	7.4	21.4	6.9	22.2
Number of results fulfilling analytical quality requirement	20/23	19/23	23/23	15/23

Table 1.

Inter and intra-operator variability in the measurement of the packed cell volume (PCV)

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BACKGROUND

Packed cell volume (PCV) measurement is routinely used to estimate erythroid mass of the patient and is a simple and inexpensive diagnostic tool in veterinary practice. There is likely to be variation in the measured result due to intra and inter-operator variation as well as analytical errors. Examples of analytical errors would include failure to adequately mix the sample prior to drawing up the blood in the microhaematocrit tube or failure to accurately align the tube in the reader. To the authors' knowledge, there is no data on the effect of this variation on sample measurement.

OBJECTIVE

To assess the impact of inter and intra-operator variation on measurement of PCV among veterinary students and vets.

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