(450 word abstract)

Use of citrated whole blood for point-of care viscoelastic coagulation testing in dogs

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Introduction:
Viscoelastic testing provides a more comprehensive view of coagulation beyond traditional factor-based tests. This method of testing has historically been time intensive and subject to sample handling errors. Recently, a new portable bedside coagulation monitor (VCM Vet) has provided a user-friendly, cartridge-based method to perform viscoelastic testing. However, the use of native whole blood (NWB) limits the time to analyze the sample to minutes. The objective of this study is to assess whether citrated whole blood (CWB) can be utilized with the cartridge-based system and whether the results are comparable to those of NWB. A secondary objective is to assess the viability of CWB results after up to 4 hours of resting.

Methods:
The study population consisted of 10 healthy mixed breed dogs. Whole blood samples were collected via jugular venipuncture with a 21-gauge needle and syringe. Blood was immediately transferred to the VCM test cartridge for NWB control group analysis per the manufacturer's instructions, and the remainder was used to fill two 3.2% sodium citrate vacutainer tubes. Test group analysis was performed on samples from each tube concurrently after a rest period of 30 minutes (baseline), 2 hours (Cit-2), and 4 hours (Cit-4). CWB samples were recalcified for analysis by adding 20 µL of 0.2M $CaCl_2$ to 340 µL CWB immediately prior to introduction into the test cartridge. Data was recorded for clot time (CT), clot formation time (CFT), alpha angle (AA), amplitude at 10 (A10) and 20 minutes (A20), maximum clot firmness (MCF), and clot lysis at 30 (LY30) and 45 minutes (LY45). Results from the citrate groups were compared to the control group and to the citrated baseline to assess for differences. Overall results were compared using mixed ANOVA models. Where found, specific differences were evaluated using Tukey's test. Within-sample variation (CV%) was investigated and reported as median (range). A $p < 0.05$ was considered significant.

Results:
Samples were obtained for a total of 10 control runs and 20 CWB runs. Comparison of controls to the citrated test groups revealed significant differences in CT ($p < 0.001$) and MCF ($p < 0.002$). There were no significant differences between test groups compared to citrated baselines for any parameter. Median coefficients of variation were 6.8% (0-68.8%) for CT, 7.9% (0-32.9%) for CFT, 2.4% (0-19.46%) for AA, 3.8% (0-17.3%) for A10, 4.5% (0-23.1%) for A20, 3.2% (0-27.4%) for MCF, 0% (0-17.4%) for LY30, and 0% (0-16.3%) for LY45.

Conclusion: Citrated whole blood samples can be used with the VCM Vet device, however, new reference intervals for use with CWB will be required. Results using CWB samples are not significantly different from baseline after up to 4 hours of resting.

(350 word abstract)

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Introduction:
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Methods:
The study population consisted of 10 healthy mixed breed dogs. Whole blood samples were collected via jugular venipuncture. Blood was immediately transferred to the VCM test cartridge for NWB control group analysis per the manufacturer's instructions, and the remainder was used to fill two 3.2% sodium citrate vacutainer tubes. Test group analysis was performed on samples from each tube concurrently after a rest period of 30 minutes (baseline), 2 hours, and 4 hours. CWB samples were recalcified for analysis immediately prior to introduction into the test cartridge. Data was recorded for all reported parameters. Results from the citrate groups were compared to the control group and to the citrated baseline to assess for differences. Overall results were compared using mixed ANOVA models. Where found, specific differences were evaluated using Tukey's test. Within-sample variation (CV%) was investigated and reported as median (range). A $p < 0.05$ was considered significant.

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Samples were obtained for a total of 10 control runs and 20 CWB runs. Comparison of controls to the citrated test groups revealed significant differences in CT ($p < 0.001$) and MCF ($p < 0.002$). There were no significant differences between test groups compared to citrated baselines for any parameter. Selected median coefficients of variation were 6.8% (0-68.8%) for clot time, 2.4% (0-19.46%) for alpha angle, 3.2% (0-27.4%) for maximum clot firmness, and 0% (0-16.3%) for 45 minute lysis.

Conclusion: Citrated whole blood samples can be used with the VCM Vet device, however, new reference intervals for use with CWB will be required. Results using CWB samples are not significantly different from baseline after up to 4 hours of resting.