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Dilutional Effect of Ethylenediaminetetraacetic Acid on Packed Cell Volume in Healthy Dogs

Elizabeth Ross

New River Veterinary Specialists, USA

Objective: The purpose of this study was to determine the effect of appropriate, over-filled and under-filled K3 EDTA spray-dried tubes with various concentrations of healthy canine blood on centrifuged PCV.

Animals: 94 healthy adult canines

Procedures: 6mL of blood was obtained which was then transferred to non-heparinized hematocrit tubes, then 1.3mL, 0.75mL, 0.5mL, and 0.25mL of blood into spray-dried plastic 1.5mL K3-EDTA as the anti-coagulant. The last 3 tubes were underfilled, as the appropriate concentration is 1.6 mg/mL or 2.08 mg/1.3 mL. Multiple samples were obtained in this study to broaden the number of concentrations obtained. The hematocrit tubes were considered the control in this study. PCV was obtained within 2 hours of collecting samples and all tubes were kept on a rocker in the meantime. Statistical analysis was done using the D'agostino-Pearson method and by visual examination of histograms using a repeated-measures ANOVA with post hoc testing using Tukey's test.

Results: There is a statistically significant difference among all groups ($P < 0.0001$). The closest difference is between 1.5 and 1.3mL ($P = 0.0138$). All other pairwise comparisons are $P < 0.0001$.

Conclusion and clinical relevance: Our study suggested that under-filling of the recommended volume in K3 EDTA vacutainer strongly influenced the PCV in healthy canines. Submitting underfilled K3 EDTA tubes result in a lower PCV than the subject has in-vivo which may lead to inappropriate therapies and potentially end-of-life discussion.

Recent publications

1. Ross EH, Dickinson A. Dilutional Effect of Ethylenediaminetetraacetic Acid on Packed Cell Volume in Healthy Dogs. J Am Anim Hosp Assoc. 2021 Sep 1;57(5):199-204. doi: 10.5326/JAAHA-MS-7060. PMID: 34370848.

Biography

Elizabeth Ross, originally from South Florida, received her Doctorate of Veterinary Medicine from Ross University School of Veterinary Medicine in 2016. She completed her clinical year (2015-2016) in Auburn University College of Veterinary Medicine in Alabama followed by a Small Animal Rotating Medicine and Surgical Internship at Pieper Memorial's 24-hour Emergency and Specialty Hospital in Connecticut. Her success in this internship led to her selection for the 3-year Small Animal Emergency and Critical Care Residency at the high-volume multispecialty Pittsburgh Veterinary Specialty and Emergency Center, completed in 2020. She is a Diplomate of the American College of Veterinary Emergency and Critical Care. She relocated to South Carolina where she helped develop and expand the critical care service at Upstate Veterinary Specialists. The opportunity to contribute to the positive culture and growth of New River Veterinary Specialists piqued her interest and led her to join the NRVS Emergency and Critical Care team as a staff Criticalist. She greatly enjoys teaching and mentoring technicians, interns, and emergency doctors. She has been published in the Journal of the American Animal Hospital Association. Outside of work, she enjoys spending time with her three cats, her fiancé Larry and her Goldendoodle Kramer. In her free time, she spends time fine-tuning her photography skills, traveling, hiking, and running.

ehrossdvm@gmail.com