Effects of Time of Collection and Sample Processing on von Willebrand Factor Concentration in Retired Racing Greyhounds

L.M. Marin, C.G. Couto, M.C. Iazbik, N. Westendorf, and P. Vilar Saavedra

Background: Concentrations of von Willebrand factor (vWF) are less than 30% in approximately 10% of Greyhounds.

Hypothesis: That sample collection, processing, and storage can affect the concentration of vWF in plasma of Greyhounds.

Animals: Nineteen healthy former racing Greyhounds.

Methods: Prospective study: Blood samples were obtained from the jugular vein of dogs at 4 times during the day. Samples were divided and processed in each of 3 ways. The 1st tube was centrifuged immediately, the 2nd tube was kept in a household refrigerator, and the 3rd tube was kept at room temperature for 3 hours before centrifugation and processing.

Results: There were no significant differences in the vWF concentration between different sample storage and processing (P=0.31). There was no statistically significant diurnal variation in vWF concentration in the samples evaluated (P=0.37).

Conclusions and Clinical Importance: Time of sample collection and short-term storage temperature do not influence the vWF concentration in retired racing Greyhounds.

Key words: Cold activation; Dog; Greyhound; Laboratory misdiagnosis; Preanalytical variables.
using ANOVA for repeated measures. All results are reported as means ± standard deviations. Significance was set at < 0.05. Graph Pad Prism software was used for statistical analysis.

Results

There were no significant differences in the vWF concentration between the reference samples and the samples stored under refrigeration or at room temperature for 3 hours before plasma separation \(P = .31\) (Fig 1). There was no statistically significant diurnal variation in vWF concentration in the samples evaluated \(P = .37\) (Fig 2).

Discussion

Short-term sample storage at low temperature led to the potential misdiagnosis of vWD in humans, apparently due to a “cold activation” phenomenon. However collection and sample preparation (storage time, freezing, and thawing) did not affect vWF concentrations in dogs. Samples intentionally subject to hemolysis by freezing have lower mean vWF concentration.

In contrast to previous studies in humans, we demonstrated that the vWF concentration in retired racing Greyhounds does not vary when the samples are stored at different temperatures.

In humans there are circadian variations in fibrinogen, D-dimer, C-reactive protein, tissue plasminogen activator antigen (t-PA), and vWF concentrations; and seasonal variations in t-PA and vWF. We did not find a diurnal variation in vWF concentration in retired racing Greyhounds in this study.

A large Greyhound adoption program (National Greyhound Adoption Program—NGAP—Philadelphia) documented that 32% of 486 Greyhound plasma samples centrifuged at room temperature, reportedly within an hour of collection, and evaluated between February 2000 and May 2001 at the Cornell Comparative Hemostasis Laboratory, had concentrations of vWF below 50% (Wolf, personal communication). The high proportion of dogs with low vWF in the NGAP samples was likely due to other preanalytical variables, such as hemolysis or sample clotting. The results of our study indicate that time of collection or cold activation did not influence the vWF concentration in retired racing Greyhounds.

Footnotes

\(b\) Kendal, Monoject, Mansfield MA
\(c\) Animal Health Diagnostic Laboratory, Cornell University, Ithaca, NY
\(d\) Graph Pad, San Diego, CA

References