

CRITICAL CARE: YEAR IN REVIEW

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White blood cell count and the sodium to potassium ratio to screen for hypoadrenocorticism in dogs.

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Abstract

BACKGROUND: Abnormal sodium to potassium (Na:K) ratios can raise suspicion for hypoadrenocorticism (HA). Although dogs with HA usually have normal leukograms, their white blood cell counts may be useful in screening for HA.

OBJECTIVES: To examine the utility of combining the Na:K ratio with white blood cell counts to screen for HA in hospitalized dogs requiring fluid treatment administered i.v..

ANIMALS: Fifty-three dogs with confirmed HA and 110 sick dogs confirmed not to have HA.

METHODS: Retrospective, case-control study. Dogs were included if they were hospitalized and administered fluids i.v., had a complete blood count and measurement of serum Na and K concentrations. HA was diagnosed using an ACTH stimulation test, or ruled out by measurement of basal serum cortisol concentration.

RESULTS: The receiver operating characteristic (ROC) curve for the lymphocyte count was not significantly different from the ROC curve of the Na:K ratio ($P = .55$). The ROC curve for the model combining the Na:K ratio and lymphocyte count was superior for identifying dogs with HA compared to the Na:K ratio ($P = .02$) or lymphocyte count ($P = .005$) alone. At the 100% sensitivity cutoff, lymphocyte count was more specific for detection of HA than Na:K ($P < .001$).

CONCLUSIONS AND CLINICAL IMPORTANCE: A combination of the Na:K ratio and lymphocyte count provides a better screening test for HA compared to the Na:K ratio or lymphocyte count alone. At 100% sensitivity, the lymphocyte count is a more specific test for HA than the Na:K.

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Randomized, blinded comparison of epinephrine and vasopressin for treatment of naturally occurring cardiopulmonary arrest in dogs.

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Abstract

BACKGROUND: Administration of epinephrine during CPR is recommended for treatment of cardiopulmonary arrest (CPA) in dogs. Administration of epinephrine during CPR might be associated with deleterious adverse effects. Vasopressin has been studied for use in CPR as an alternative.

HYPOTHESIS: That administration of vasopressin instead of epinephrine with standard CPR techniques will result in improved outcome.

ANIMALS: Seventy-seven client-owned dogs identified in the ER/ICU with CPA were eligible for inclusion.

METHODS: Randomized, prospective clinical study. Dogs were randomized to receive epinephrine (0.01-0.02 mg/kg) or vasopressin (0.5-1 U/kg) in a blinded fashion. Attending veterinarians were asked to adhere to standardized CPR protocol for the 1st 6 minutes of CPR, during which time doses of the study drug were administered at 3-minute intervals.

RESULTS: A total of 60 dogs completed this study with 31 receiving epinephrine and 29 receiving vasopressin. Overall rate of return of spontaneous circulation (ROSC) was 60% (36/60). 32% (19/60) of dogs survived to 20 minutes, 18% (11/60) survived to 1 hour. No difference was seen in rates of ROSC between the 2 groups ($P = .20$). Dogs receiving epinephrine were more likely to survive to 1 hour (odds ratio 5.86; 95% CI: 1.19-28.95) than those receiving vasopressin ($P = .027$).

CONCLUSIONS AND CLINICAL IMPORTANCE: ROSC was similar in dogs receiving epinephrine or vasopressin. In this study, a survival advantage at 1 hour was seen in those animals receiving epinephrine. No advantage of routine use of vasopressin over epinephrine was detected. Further studies are required to examine subgroups of dogs that might benefit from specific interventions.

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A multi-institutional study evaluating the diagnostic utility of the spec cPL™ and SNAP® cPL™ in clinical acute pancreatitis in 84 dogs.

McCord K, Morley PS, Armstrong J, Simpson K, Rishniw M, Forman MA, Biller D, Parnell N, Arnell K, Hill S, Avgeris S, Gittelman H, Moore M, Hitt M, Oswald G, Marks S, Burney D, Twedt D.

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Abstract

BACKGROUND: Pancreas-specific lipase is reported to aid in diagnosing acute pancreatitis (AP) in dogs but has not been rigorously evaluated clinically.

HYPOTHESIS/OBJECTIVES: To describe variability of disease in dogs with suspected clinical AP, and to evaluate accuracy of 2 pancreatic-specific lipase immunoassays, Spec cPL (SPEC) and SNAP cPL (SNAP), in diagnosing clinical AP. We hypothesized that SPEC and SNAP provide better diagnostic accuracy than serum amylase or total lipase.

ANIMALS: A total of 84 dogs; 27 without AP and 57 with clinical signs associated with AP.

METHODS: Multicenter study. Dogs were prospectively enrolled based upon initial history and physical examination, then retrospectively classified into groups according to the likelihood of having clinical AP by a consensus of experts blinded to SPEC and SNAP results. Bayesian latent class analyses were used to estimate the diagnostic accuracy of SPEC and SNAP.

RESULTS: The estimates for test sensitivities and specificities, respectively, ranged between 91.5-94.1% and 71.1-77.5% for SNAP, 86.5-93.6% and 66.3-77.0% for SPEC (cutoff value of 200 µg/L), 71.7-77.8% and 80.5-88.0% for SPEC (cutoff value of 400 µg/L), and were 52.4-56.0% and 76.7-80.6% for amylase, and 43.4-53.6% and 89.3-92.5% for lipase.

CONCLUSIONS AND CLINICAL IMPORTANCE: SNAP and SPEC have higher sensitivity for diagnosing clinical AP than does measurement of serum amylase or lipase activity. A positive SPEC or SNAP has a good positive predictive value (PPV) in populations likely to have AP and a good negative predictive value (NPV) when there is low prevalence of disease.

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Adverse reactions from essential oil-containing natural flea products exempted from Environmental Protection Agency regulations in dogs and cats.

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Abstract

OBJECTIVE: To describe adverse effects in dogs and cats exposed to Environmental Protection Agency exempted plant-derived flea preventatives containing mixtures of essential oils.

DESIGN: Retrospective study from 2006 to 2008.

SETTING: Records of dog and cat cases were reviewed from the American Society for the Prevention of Cruelty to Animals, Animal Poison Control Center database.

ANIMALS: Thirty-nine cats and 9 dogs with history of exposure to natural flea preventatives.

MEASUREMENTS AND MAIN RESULTS: The following information was retrieved from each incident: number of animals, species involved, frequency, types, onset time, duration of clinical signs, exposure appropriateness, final outcome, and treatment information. Ninety-two percent of animals (n = 44) showed presence of one or more adverse effects. The frequency of adverse effects in dogs (n = 8; 89%) and cats (n = 36; 92%) was similar. Onset time of adverse effects in 39 of 44 animals occurred within 24 hours. The duration of signs in 24 animals ranged from 30 minutes to 149 hours. The products were used as per label in 77% animals (n = 37). Of 28 animals with known outcome, 50% (n = 14) recovered with bathing alone while others received intravenous fluids, muscle relaxants, and anticonvulsive medications. Death (1 cat; n = 1/28; 4%) or euthanasia (1 cat and 1 dog; n = 2/28; 7%) was reported in 3 animals.

CONCLUSION: Dogs and cats can experience significant adverse effects when exposed to plant-derived flea preventatives even when used according to label directions. The number of reports of exposure in cats was higher than dogs, but the frequency of reported adverse effects was similar between the 2 species. Agitation and hypersalivation were common in cats, whereas lethargy and vomiting were common in dogs.

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Effects of canine parvovirus strain variations on diagnostic test results and clinical management of enteritis in dogs.

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Abstract

OBJECTIVE: To estimate the prevalence of canine parvovirus (CPV) strains among dogs with enteritis admitted to a referral hospital in the southwestern United States during an 11-month period and to compare diagnostic test results, disease severity, and patient outcome among CPV strains.

DESIGN: Prospective observational study.

ANIMALS: 72 dogs with histories and clinical signs of parvoviral enteritis.

PROCEDURES: For each dog, a fecal sample or rectal swab specimen was evaluated for CPV antigen via an ELISA. Subsequently, fecal samples (n = 42 dogs) and pharyngeal swab specimens (16) were obtained and tested for CPV antigen via an ELISA and CPV DNA via a PCR assay. For specimens with CPV-positive results via PCR assay, genetic sequencing was performed to identify the CPV strain.

RESULTS: 56 dogs tested positive for CPV via ELISA or PCR assay. For 42 fecal samples tested via both ELISA and PCR assay, 27 had positive results via both assays, whereas 6 had positive PCR assay results only. Ten pharyngeal swab specimens yielded positive PCR assay results. Genetic sequencing was performed on 34 fecal or pharyngeal swab specimens that had CPV-positive PCR assay results; 25 (73.5%) were identified as containing CPV type-2c, and 9 (26.5%) were identified as containing CPV type-2b. No association was found between CPV strain and disease severity or clinical outcome.

CONCLUSIONS AND CLINICAL RELEVANCE: CPV type-2b and CPV type-2c posed similar health risks for dogs; therefore, genetic sequencing of CPV does not appear necessary for clinical management of infected patients. The diagnostic tests used could detect CPV type-2c.

Clinical evaluation of a single dose of immune plasma for treatment of canine parvovirus infection.

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Abstract

OBJECTIVE: To evaluate the efficacy of administration of a single 12-mL dose of canine parvovirus (CPV)-immune plasma for treatment of CPV enteritis.

DESIGN: Prospective, randomized, double-blinded, placebo-controlled clinical trial.

ANIMALS: 14 dogs with naturally occurring CPV enteritis.

PROCEDURES: Dogs were assigned to treatment groups on the basis of randomization tables and were administered a single i.v. dose of CPV-immune plasma (treatment group) or an equivalent volume of saline (0.9% NaCl) solution (placebo group) within 18 hours after admission to the hospital. Treatment and outcome variables evaluated included neutrophil, monocyte, and CPV counts; number of days of hospitalization; changes in body weight; and cost of treatment.

RESULTS: When dogs treated with CPV-immune plasma were compared with dogs treated with saline solution, there were no significant differences detected among neutrophil or monocyte counts, magnitude of viremia, weight change, number of days of hospitalization, or cost of treatment.

CONCLUSIONS AND CLINICAL RELEVANCE: Administration of a single 12-mL dose of immune plasma soon after the onset of CPV enteritis in dogs was not effective in ameliorating clinical signs, reducing viremia, or hastening hematologic recovery.

Retrospective evaluation of the effectiveness of epsilon aminocaproic acid for the prevention of postamputation bleeding in retired racing Greyhounds with appendicular bone tumors: 46 cases (2003-2008).

Marín LM, Iazbik MC, Zaldivar-Lopez S, Lord LK, Stingle N, Vilar P, Lara-Garcia A, Alvarez F, Hosoya K, Nelson L, Pozzi A, Cooper E, McLoughlin MA, Ball R, Kisseberth WC, London CA, Dudley R, Dyce J, McMahon M, Lerche P, Bednarski R, Couto CG.

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Abstract

OBJECTIVES: To determine the frequency of delayed postoperative bleeding in retired racing Greyhounds with appendicular bone tumors undergoing limb amputations. To identify if administration of epsilon-aminocaproic acid (EACA) was effective on the prevention of postoperative bleeding.

DESIGN: Retrospective study from December 2003 to December 2008.

SETTING: Veterinary university teaching hospital.

ANIMALS: Forty-six retired racing Greyhounds (RRGs) diagnosed with primary appendicular bone tumors that underwent limb amputation were included in the study.

INTERVENTIONS: None.

MEASUREMENTS AND MAIN RESULTS: Thirteen of 46 RRGs (28%) included in the study had delayed postoperative bleeding starting 48-72 h after surgery. Bleeding episodes included cutaneous, subcutaneous, and external bleeding that extended from the area of the surgical site that became widespread within hours, and that required administration of blood components. A paired t-test suggests that there was a significant decrease in PCV postoperatively for both dogs that bled and dogs that did not bleed ($P < 0.0001$). Forty of 46 RRGs (86%) received either fresh frozen plasma (FFP) or EACA or both, for the prevention of postoperative bleeding. A logistic regression model determined that dogs that did not receive EACA were 5.7 times more likely to bleed than dogs that did receive EACA, when controlling for whether or not they received FFP (95% CI: 1.02-32.15, $P = 0.047$).

CONCLUSION: This retrospective study suggests that preemptive postoperative administration of EACA appears to be efficacious in decreasing the frequency of bleeding in RRGs undergoing limb amputation; however, a prospective study is warranted to corroborate its effectiveness.

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Epsilon Aminocaproic Acid for the Prevention of Delayed Postoperative Bleeding in Retired Racing Greyhounds Undergoing Gonadectomy.

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Abstract

OBJECTIVE: To evaluate the effects of epsilon aminocaproic acid (EACA) on the prevalence of postoperative bleeding in retired racing Greyhounds (RRG), and to assess its effects on selected thrombelastography (TEG) and fibrinolysis variables.

STUDY DESIGN: Double-blinded, prospective, randomized study.

METHODS: 100 RRG had elective ovariohysterectomy or orchiectomy and were administered EACA or placebo for 3 days after surgery. TEG variables were analyzed preoperatively and 24, 48, and 72 hours after surgery.

RESULTS: Thirty percent (15/50) of RRG in the placebo group had delayed postoperative bleeding starting 36-48 hours after surgery compared with 10% (5/50) in the EACA group ($P = .012$). On the TEG variables, the slopes for R and K time were significantly different between treatment groups ($P < .05$); the R and K time decreased over time in the EACA group after surgery whereas they increased in the placebo group. The angle, maximal amplitude (MA), and G slopes were also significantly different between treatment groups ($P = .001$, $.001$, and $.006$, respectively). The angle, MA, and G increased postoperatively over time in the EACA group and decreased in the placebo group. All these changes are supportive of hypercoagulability associated with EACA administration.

CONCLUSION: Postoperative administration of EACA significantly decreased the prevalence of postoperative bleeding in RRG undergoing surgery by increasing the clot strength.

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