Hyperkalemia

Julie Allen, BVMS, MS, MRCVS, DACVIM (SAIM), DACVP

FOR MORE
Find more Differential Diagnosis lists in upcoming issues of *Clinician's Brief* and on cliniciansbrief.com

- Hypokalemia
- Eosinophilia
- Basophilia
- Increased & Decreased Blood Urea Nitrogen
- Increased & Decreased Creatinine
- Neutropenia
- Panting
- Hypercholesterolemia
- Hypocholesterolemia
- Hypoalbuminemia
- Increased Total Thyroxine
- Decreased Total Thyroxine
- Hypoglycemia
- Epistaxis
- Regurgitation

Following are differential diagnoses, listed in order of likelihood,* for patients presented with hyperkalemia.

- Pseudohyperkalemia
  - Potassium EDTA contamination
  - Hemolysis (in vitro or in vivo) or RBC leakage in certain Asian breeds that have high-potassium erythrocytes (eg, Shiba Inu) or any breed with marked reticulocytosis
  - Thrombocytosis and, possibly, marked leukocytosis (eg, leukemia)
  - Contamination with high-potassium fluids due to collection from improperly flushed IV line
- Urethral (or, less likely, bilateral ureteral) obstruction
- Acute kidney injury (oliguric/anuric)
- End-stage kidney disease (oliguric/anuric)
- Uroabdomen
- Hypoadrenocorticism
- Chronic kidney disease
- Drug-induced/iatrogenic cause; usually only in combination with other issues (eg, decreased renal function). May decrease renal excretion and/or affect transcellular movement
  - ACE inhibitors (eg, enalapril)
  - Aldosterone antagonists (eg, spironolactone)
  - Angiotensin II-receptor blockers (eg, telmisartan)
  - NSAIDs
  - Cyclosporine or tacrolimus
  - Trimethoprim/sulfonamides (trimethoprim decreases potassium excretion in the distal renal tubule)
  - Trilostane
  - Mitotane
  - Heparin
  - Total parenteral nutrition
  - Digoxin
  - β blockers
- Metabolic (rarely respiratory) acidosis
- Insulin deficiency
- Massive tissue damage (eg, rhabdomyolysis, reperfusion injury after thromboembolic event, gastric torsion)
- *Trichuris vulpis* infection
- Severe malabsorption
- Salmonellosis
- Perforated duodenal ulcer
- Chylous effusions following drainage
- Peritoneal effusion (cats)
- Hyporeninemic hypoaldosteronism
- Late pregnancy (greyhounds)
- Acute tumor lysis syndrome
- Strenuous exercise
- Hyperkalemic periodic paralysis
- Increased intake
  - Excessive potassium supplementation in IV fluids
  - High-dose potassium penicillin

*Order of likelihood is based on the author's personal experience.

References

DiBartola SP, de Morais HA. Disorders of potassium: hypokalemia and hyperkalemia. In: DiBartola SP, ed. *Fluid, Electrolyte, and Acid-Base Disorders*. 4th ed. St Louis, MO: Elsevier Saunders; 2012:108-113.

George JW, Zabolotosky SM. Water, electrolytes and acid base. In: Latimer KS, ed. *Duncan and Prasse's Veterinary Laboratory Medicine: Clinical Pathology*. 5th ed. Ames, IA: Wiley-Blackwell; 2011:158-161.

Kreissler J, Langston CE. A case of hyporeninemic hypoaldosteronism in the dog. *J Vet Intern Med*. 2011;25(4):944-948.

Moore AR, Barger AM. Pathology in practice. *J Am Vet Med Assoc*. 2016;248(2):157-159.

Stockham SL, Scott MA. Monovalent electrolytes and osmolality. In: Stockham SL, Scott MA. *Fundamentals of Veterinary Clinical Pathology*. 2nd ed. Ames, IA: Blackwell Publishing; 2008:511-516.