Internal Medicine
VCA West Los Angeles Animal Hospital
1900 S. Sepulveda Boulevard
Los Angeles, CA 90025
P 310-473-2951 | F 310-979-5400
VCAwestlaspecialty.com

Disorders of Sodium Metabolism in Veterinary Patients

A Review of the Literature

David Bruyette, DVM DACVIM
Medical Director

Hypernatremia and hyponatremia have been associated with substantial morbidity and mortality in human patients. The incidence and importance of both hyponatremia and hypernatremia in dogs and cats has not been determined.

Two recent studies described the incidence of and prognosis associated with hypernatremia and hyponatremia in dogs and cats at a university teaching hospital.

Study Population

A total of 16,691 dogs and 4,211 cats with measured blood or serum sodium concentration.

Methods

Retrospective study. Medical records of animals with a blood or serum sodium concentration measured during a 60-month period were reviewed to determine the severity of both hyponatremia hypernatremia and its associated case fatality rate. Cases with moderate (11–15 mEq/L above the reference range) or severe hypernatremia (≥ 16 mEq/L above the reference range) as well as patients with moderate (11–15 mEq/L below the reference range) or severe hyponatremia (≥ 16 mEq/L below the reference range) were further reviewed.

Results

Hypernatremia:

A total of 957 dogs (5.7%) and 338 cats (8.0%) were diagnosed with hypernatremia. ***Case fatality rates of dogs and cats with hypernatremia was 20.6 and 28.1%***, respectively compared to 4.4 and 4.5% with a normal blood or serum sodium concentration ($P < .0001$). The magnitude of hypernatremia was linearly associated with a higher case fatality rate ($P < .0001$). Hypernatremia was associated with a higher case fatality rate than hyponatremia.

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Among the animals with moderate or severe hypernatremia, 50% of dogs and 38.5% of cats presented with community-acquired hypernatremia, and 50% of dogs and 61.5% of cats developed hospital-acquired hypernatremia. Hypernatremia was found infrequently in this population but was associated with increased case fatality rates in dogs and cats. Presence and severity of hypernatremia might be useful as a prognostic indicator.

Hyponatremia:

4,254 dogs (25.5%) and 2,081 cats (49.4%) were diagnosed with hyponatremia. ***Case fatality rates of dogs and cats with hyponatremia were 13.7% and 11.9%, respectively***, compared to 4.4% and 4.5% with a normal blood or serum sodium concentration ($P < 0.0001$). The magnitude of hyponatremia was linearly associated with a higher case fatality rate ($P < 0.0001$). Hyponatremia was associated with a lower case fatality rate than hypernatremia in the same population. Among the animals with moderate or severe hyponatremia, 92.1% of dogs and 90.6% of cats presented with community-acquired hyponatremia, and 7.9% of dogs and 9.4% of cats developed hospital-acquired hyponatremia.

Conclusions and clinical importance

Both hyper and hyponatremia was found commonly in this population and was associated with increased case fatality rate. Hypernatremia was less common but had a higher mortality rate than patients with hyponatremia. In addition, most dogs and cats developed hypernatremia during hospitalization emphasizing the importance of monitoring hydration status and electrolyte status and altering fluid therapy as needed. Presence and severity of sodium disorders might be useful as a prognostic indicator for patients both at the time of admission as well as during hospitalization.■

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Y. Ueda, K. Hopper, S.E. Epstein. Incidence, Severity and Prognosis Associated with Hypernatremia in Dogs and Cats. J Vet Int Med. 29: 794–800, 2015. http://onlinelibrary.wiley.com/enhanced/doi/10.1111/jvim.12582/

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Medical Director
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Dr. Bruyette received his Doctor of Veterinary Medicine degree from the University of Missouri in 1984. He completed an internship at Purdue University and a residency program in internal medicine at the University of California Davis. He was a staff internist at the West Los Angeles Veterinary Medical Group, as well as a member of the Department of Comparative Medicine at Stanford University, an Assistant Professor and Head of Internal Medicine at Kansas State University, and Director of the Analytical Chemistry Laboratory at Kansas State.

In addition to his duties as Medical Director, Dr. Bruyette practices internal medicine and specializes in the hormonal system and its diseases. His interests also include adrenal disease, diabetes and thyroid disorders. Dr. Bruyette joined VCA West Los Angeles Animal Hospital in 1996.