

Extreme hyponatraemia in a dog

Contributors: Judit Csöndes¹, DVM; Bálint Tóth¹, DVM; Viktória Kunos¹, DVM; László Mester¹, DVM; Gergely Jakabos², DVM; Nándor Balogh¹, DVM, PhD, Dipl. ECVCP

¹PraxisLab Ltd., Budapest, Hungary

²Napkelet Veterinary Clinic, Budapest, Hungary

csondesjudit@praxislab.hu

Specimen

peripheral blood and urine samples

Signalment

2-year-old, female, mix-breed dog

History & physical examination

The dog had been treated with carprofen, pantoprazole and gabapentin due to backpain with transient improvement in a primary care clinic. Weakness, tremor, and vomiting appeared newly.

By physical examination body temperature was 37.7°C, mucosal membranes were slightly pale and lumbar region was sensitive by palpation.

Laboratory alterations

CBC measured by ADVIA®2120i was almost unremarkable except slight **microcytosis with hyperchromasia**, and **decreased neutrophil-to-lymphocyte ratio: 1.7 (Table 1.)**.

Table 1. Selected numerical data of the complete blood count

Parameters	Results	Reference intervals
Red blood cell	6.86	5.50 - 8.50 10 ¹² /L
Hemoglobin	148	120 - 180 g/L
MCV	59	61 - 80 f/L
MCH	21.5	20.0 - 26.0 pg
MCHC	367	300 - 360 g/L
Platelet	242	150 - 450 10 ⁹ /L
White blood cell	9.5	6.0 - 15.0 10 ⁹ /L
Neutrophil abs.	5.6	4.3 - 9.0 10 ⁹ /L
Lymphocyta abs.	3.23	0.50 - 4.50 10 ⁹ /L
Monocyta abs.	0.52	0.25 - 1.00 10 ⁹ /L
Eosinophil abs.	0.12	0.10 - 1.20 10 ⁹ /L
Basophil abs.	0.02	0.01 - 0.08 10 ⁹ /L
Large Unstained Cells abs.	0.01	0.03 - 0.58 10 ⁹ /L
Reticulocyte abs.	8.6	<60 10 ⁹ /L

The clinical chemistry profile revealed **elevated blood sugar level**, **mild** presumptive prerenal **azotaemia**, slightly **elevated CRP-level** and **severe hyponatraemia and hypochloraemia** with **moderate hyperkalaemia** (electrolyte values were double checked) (**Table 2.**).

Table 2. Results of the biochemistry profile

Parameters	Results	Reference intervals
Total protein	65	55 - 75 g/L
Albumin	35.7	25.0 - 41.0 g/L
Globulin	29.3	20.0 - 45.0 g/L
ALT	54	5 - 60 U/L
AST	46	10 - 50 U/L
GLDH	6	- 10 U/L
ALP	141	- 280 U/L
GGT	2	- 9 U/L
Total bilirubin	4.0	0.1 - 5.1 µmol/L
Amylase	834	100 - 1200 U/L
Lipase (DGGR)	19	8 - 81 U/L
CK	89	20 - 225 U/L
LDH	71	20 - 250 U/L
Triglycerid	0.54	0.30 - 1.20 mmol/L
Cholesterol	5.7	3.2 - 6.2 mmol/L
Glucose (serum)	12.2	2.8 - 4.9 mmol/L
Fructosamine	329	187 - 386 µmol/L
Urea	11.0	2.5 - 6.7 mmol/L
Creatinine	69	20 - 150 µmol/L
Na⁺	97	135 - 155 mmol/L
K⁺	6.35	3.60 - 5.60 mmol/L
Na/K ratio	15.28	
Cl⁻	67	100 - 116 mmol/L
calculated osmolality	217.2	290-310 mOsm/kg
Total calcium	2.23	2.50 - 3.10 mmol/L
Total magnesium	0.83	0.70 - 1.00 mmol/L
Phosphate	1.8	0.8 - 1.6 mmol/L
C-reactive protein	17.3	- 10.0 mg/L

Question1: What are the main mechanisms leading to hyponatraemia in dogs?

Question2: Which further diagnostic steps are recommended to identify underlying mechanism(s) of hyponatraemia?

Question3: How can be differentiated Syndrome of Inappropriate ADH Secretion (SIADHS) from Addison's disease?

Question4: What is the proposed mechanism of ACTH-stimulated aldosterone secretion?