

ECLAMPSIA IN BELGIAN MALINOIS DOG: A CASE REPORT

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SUMMARY

A 1.5-year-old Belgian Malinois large breed female dog weighing 19.8 kg was brought to the Institute's Teaching Veterinary Clinical Complex with the main complaint of sudden convulsions, whole-body muscle weakness, profuse salivation and panting after 20 days of whelping. The clinical examination revealed fever, tachypnea and increased pulse rate. Serum biochemistry showed hypocalcemia with normal phosphorus, sodium, potassium concentrations and pH in serum. Based on history, clinical examination and laboratory findings, the case was diagnosed as eclampsia in lactating dog. Here, successful treatment of eclampsia in Belgian malinois large breed dog has been described.

Keywords: Belgian malinois, Calcium gluconate, Eclampsia, Hypocalcemia

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Eclampsia, also known as puerperal tetany or hypocalcaemia, is a deficiency illness and life threatening fatal disorder in dogs (Coady *et al.*, 2019). It is caused either by lack of dietary calcium and/or vitamin D, or by a decrease in the activity of the parathyroid gland (Côté and Sauv , 2011; Akiibinu *et al.*, 2013). Aside from that, factors including bitches in their first heat, small breeds, immature bitches with big litter sizes, poor nutrition, and stress before and during pregnancy all contribute to this illness (Pathan *et al.*, 2011). Bitches are commonly diseased after 1-3 weeks of whelping; however, it can also occur during pregnancy. Young, toy, and small-breed female dogs are the most commonly affected (Kutzler, 2018). There is a scarcity of evidence on the diagnosis and management of eclampsia in large breed dogs in recent literatures. The authors present case reports on the diagnosis and management of eclampsia in Belgian melinois, a rare occurrence in such a large breed dog.

A 1.5-year old Belgium Malinois bitch weighing 19.8 kg was brought to Teaching Veterinary Clinical Complex of institute with the history of whole body stiffness, whelping 20 days ago and eight healthy puppies were born. The bitch was routinely dewormed and vaccinated before conception. There was no history of additional supplementation of vitamins and minerals during pregnancy. Clinical examination revealed stiffness of all four limbs, severe panting, salivation, convulsions, fatigue and lateral recumbency of dog (Fig. 1). Rectal temperature, pulse and respiratory rates were 103.5  F, 120/min and 40/min, respectively.

Blood was collected from cephalic vein into vials with and without anticoagulant. The serum was separated

by centrifuging blood at 3000 rpm for 10 minutes at 4  C. The hemogram of whole blood was performed to measure haemoglobin (Hb), total erythrocyte count (TEC), total leukocyte count (TLC) manually (Jain, 1986). The serum was analysed to measure the concentrations of alanine aminotransferase (ALT), total protein (TP), albumin, creatinine, blood urea nitrogen (BUN), calcium, phosphorus in semi-automated serum analyser (Erba Chem 5x clinical analyzer). The levels of sodium, potassium, chloride, ionised calcium, and pH of serum were measured by automatic electrolyte analyser (HDC Lyte electrolyte analyser).

The hemogram showed slight anaemic picture (Hb, 8.2 g % and TEC, 4.1×10^6 /c.mm.). Biochemical indices showed sever hypocalcemia (4.12 mg/dL), low ionised calcium (0.6 mmol/L), hyponatremia (138.3 mmol/L), hypochloremia (97.6 mmol/L) with normal phosphorus (5.18 mg/dL), serum glucose (83 mg/dL), potassium (5.6 mmol/L) levels and pH (7.4) (Table 1). The hypocalcemia conditions are also observed in other conditions like pancreatitis, renal and parathyroid gland failure and antifreeze poisoning. However, in this case, hypocalcemia of the nursing bitch could be due to heavy milk production resulting into seizures. Pets with abnormally low calcium levels often show signs of muscle twitching, loss of appetite, weakness, and listlessness. In severe cases, pets may have convulsions or seizures. Based on history, clinical examination and laboratory findings, the present case was diagnosed as eclampsia (Table 1).

Eclamptic bitch was treated initially with meloxicam at the dose rate of 0.2 mg/kg body weight by intramuscular (IM) route to control hyperthermia followed by 10% calcium gluconate at the dose rate of 1.0 mL/kg body weight (BW)

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Fig. 1. (A) Fore limbs stiffness in a lactating dog; (B) Hind limbs stiffness; (C) Severe panting with open mouth; (D) Recovery and walking after successful therapy.

Table 1
Haemato-biochemical findings

Parameters	Results	Normal range (Aiello and Moses, 2016)
Haemoglobin (g %)	8.2	11.9-18.9
Total erythrocyte count (/mm ³)	4.1×10 ⁶	4.95-7.87×10 ⁶
Total leucocyte count (/mm ³)	12.2×10 ³	5.0-14.1×10 ³
ALT (μ/L)	103	10-109
Total protein (g/dL)	5.8	5.4-7.5
Albumin (g/dL)	3.1	2.3-3.1
BUN (mg/dL)	9.24	8-28
Creatinine (mg/dL)	0.63	0.5-1.7
Ionised calcium (mmol/Lit)	0.60	1.18-1.37
Calcium (mg/dL)	4.12	9.1-11.7
Phosphorus (mg/dL)	5.18	2.9-5.3
Potassium (mmol/Lit)	5.6	3.9-5.1
Sodium (mmol/Lit)	138.3	142-152
Chloride (mmol/Lit)	97.6	110-124
Serum Glucose (mg/dL)	83	76-119
Serum pH	7.4	7.31-7.42

through slow intravenous (IV) route along with dextrose normal saline after temperature subsides. The heart rate was

monitored continuously by auscultation during calcium gluconate infusion. Additionally, multivitamin (folic acid + methylcobalmine + ascorbic acid + niacinamide; Eldevit; Elder pharmaceutical ltd.) 2.0 mL total dose was administered by IV route and pheniramine maleate (Avil: Sanofi India Ltd.) at the dose rate of 0.5 mg/Kg BW were injected by IM route. The condition of bitch recovered considerably from body stiffness, convulsions and general weakness after therapy. To counteract the recurrence of disease, oral administration of calcium and vitamin D (Ostopot; Virbac) at the dose rate of 0.5 ml/Kg b. wt., BID for 20 days and hematinic preparation (Ferrinal; Pfarmacia Bioceuticals) 0.5 ml/ Kg b. wt., twice daily for 10 days was advised. The remarkable clinical improvement was noticed after three hours of treatment. Owner was advised to provide milk replacer to all the puppies and weaning of all the puppies. The serum was reanalyzed for Ca level after 15 days and it was found within normal range (9.4 mg/dL). This case recovered uneventfully.

Eclampsia in recently parturated dogs is characterized by an imbalance between extracellular calcium (Ca) input and throughput due to increased milk drainage. In the

present case, the characteristic nervous signs such as the stiffness of body and legs, panting, salivation, convulsions, and lateral recumbency could be due to loss of Ca resulting to increased permeability of ions from nerve membrane and neuromuscular tetany. Here, marked hypocalcemia (4.3 mg/dL), low ionised Ca (0.6 mmol/L), hyponatremia (138.3 mmol/L), hypochloremia (97.6 mmol/L) were the typical biochemical alterations of the affected bitch and similar findings were recorded earlier in bitches with eclampsia (Pathan *et al.*, 2011). The concentration of ionized Ca (0.8 mmol/L) is more sensitive indicator of extracellular Ca status than total Ca in dogs with eclampsia (Biddle and Macintire, 2000). However, the total Ca level also provides sufficient information for the diagnosis of hypocalcaemia where an ionized Ca concentration is not available (Aroch *et al.*, 1999). Here, profound decrease of both total and ionized Ca in affected bitch indicated the confirmatory diagnosis of the case.

Immediate and intensive supportive therapy plays a key role in the prognosis and outcome of the disease. In this case, calcium gluconate was administered immediately to rectify the deficiency of Ca in circulation, whereas, normal saline was given to restore fluid status of patient. During administration of Ca preparation, the bitch was monitored by auscultation to avoid the risk of arrhythmia. After treatment, calcium and vitamin D supplement was advocated to prevent the relapse and hematinic preparation was prescribed for management of anaemia. The eclampsia occurs most often in small-breed dogs with large litters,

however, development of eclampsia in the current report might be due to large size breed, young age, substantially large litter size and poor nourishment before and during pregnancy. Proper diagnosis and timely institution of specific therapy of eclampsia in lactating bitches are essential to avoid the associated life threatening condition.

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