

Arterial Blood Gas analysis in Labrador retriever puppies with parvoviral enteritis

Palanivelrajan, M^{1*}, Sumathi, D², Nambi, A.P³, and Ramesh, S⁴

Department of Veterinary Clinical Medicine,
Madras Veterinary College, Chennai 600007

Tamil Nadu Veterinary and Animal Sciences University,

^{1*}- Associate Professor, Department of Veterinary Medicine, Veterinary College and Research Institute,
Tamil Nadu Veterinary and Animal Sciences University, Udumalpet – 642 205

²- Professor and Head, Department of Veterinary Clinical Medicine, Veterinary College and Research Institute,
Tamil Nadu Veterinary and Animal Sciences University, Namakkal – 600 007

³- Professor and Head (Retd.), Department of Veterinary Clinical Medicine, Madras Veterinary College, Tamil
Nadu Veterinary and Animal Sciences University, Chennai – 600 007

⁴- Professor and Head (Retd.), Central Clinical Laboratory, Madras Veterinary College, Tamil Nadu Veterinary and
Animal Sciences University, Chennai – 600 007

Abstract

Labrador Retriever Puppies aged between 3 months to 5 months with parvoviral enteritis were selected and their Arterial Blood Gas (ABG) profile was analyzed. It revealed decreased pO₂ and elevated anion gap affected puppies. There was significant reduction in the mean concentrations for plasma total CO₂ (TCO₂), partial pressure of carbon dioxide (pCO₂) and HCO₃ values.

Keywords: Arterial Blood Gas (ABG) - Canine Parvovirus (CPV)

Canine parvo viral enteritis remains a common and important cause of morbidity and mortality in young dogs. The present study was designed to evaluate the nature of acid base disturbances in Labrador puppies with Canine Parvoviral (CPV) enteritis.

The study was undertaken with the clinical cases presented to the Small Animal Medicine Referral Clinics at Madras Veterinary College. From these cases, eight (n=8) puppies of Labrador Retriever aged between 3 to 5 months with the symptoms of parvoviral enteritis such as vomiting, bloody diarrhoea, fever, weakness, inappetence, lethargy etc., were randomly selected and included in the present study. Blood samples were collected from femoral artery in a heparinised syringe as per standard protocol for estimation of Arterial Blood Gas (ABG) and ABG Parameters were evaluated by using Blood gas analyzer (SIEMENS RAPIDLAB 348). Simultaneously, faecal samples were collected from the same puppies for detection of parvo viral antigen by polymerase chain reaction (PCR). For this, DNA was extracted from faecal samples by stool DNA extraction kit. The PCR was standardised for the primer set pCPV-

2ab and pCPV- 2b, as reported by Pereira *et al.* (2000) with slight modifications and samples were tested. Data were analyzed with the statistical program (SPSS, Chicago, Illinois, USA).

The Mean ± S.E. value for pO₂ (47.43±5.73mmHg) was very low (Table 1) when compared to the reference values (91.35-106.05mmHg) reported by Kules *et al.* (2015) and 106.2mmHg by Tamura *et al.* (2015). The observed values of Anion Gap was 17.0-26.4mmol/L, which was slightly higher when compared to the reference values (5.49-19.674mmol/L) reported by Kules *et al.* (2015). Dogs with CPV enteritis were observed to have a significant higher anion gap at admission, and a lower plasma concentration of Na⁺, K⁺, and Cl⁻. In a study by Neppart *et al.* (2002), blood gas analysis of puppies admitted with CPV enteritis were found to have a significant decrease in HCO₃⁻ but a significant increase in blood pH. However such a change was not observed in this study. Rapid dehydration usually contributes to the metabolic acidosis in the pathophysiology of secretory diarrhea. Hence an early and effective fluid therapy with appropriate fluids will help in preventing these acid base and electrolyte alterations and prevent the occurrence of further complications.

*Corresponding author: palanivelrajan.m@tanuvas.ac.in
#part of Post Graduate Diploma in Small Animal Emergency and Critical Care Medicine submitted to Tamil Nadu Veterinary and Animal Sciences University, Chennai – 600 051.

Table 1: Mean ± S.E. values of Arterial Blood Gas (ABG)

Parameter	Units	Observed Range	Mean±S.E.	Reference range*
pH	-	7.275-7.427	7.39±0.02	7.37-7.47
pCO ₂	mmHg	26.0-43.7	33.03±1.99	22.62-34.52
pO ₂	mmHg	19.9-74.5	47.43±5.73	91.35-106.05
Na ⁺	mmol/L	138-152	145.00±1.54	125.10-146.10
K ⁺	mmol/L	2.64-4.29	3.44±0.20	3.57-4.81
Cl ⁻	mmol/L	101-112	106.25±1.59	96.60-115.60
HCl	%	25-46	36.00±2.41	-
HCO ₃ act	mmol/L	16.7-21-21.3	19.46±0.63	14.06-22.10
HCO ₃ std	mmol/L	18.4-22.6	20.29±0.54	-
BE (ecf)	mmol/L	(-7.6)-(-2.9)	-5.16±0.68	-12.05-1.61
BE (B)	mmol/L	(-6.7)-(-1.9)	-4.40±0.62	-9.7-0.46
Ct CO ₃	mmol/L	17.5-22.4	20.49±0.64	-
Anion Gap	mmol/L	17.0-26.4	22.48±1.08	5.49-19.67
O ₂ SAT	%	65.7-95.6	81.49±4.03	-
O ₂ CT	ml/dl	10.6-19.5	15.86±1.26	-
Ct Hb (est)	g/dl	8.7-15.8	12.26±0.82	8.46-16.61

* Reference range Kules *et al.* (2015)

Acknowledgements

The authors are thankful to the Dean, Faculty of Basic Sciences, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University, the Director of Distance Education, Tamil Nadu Veterinary and Animal Sciences University, the Dean, Madras Veterinary College, Tamil Nadu Veterinary and Animal Sciences University and the Director of Clinics, Tamil Nadu Veterinary and Animal Sciences University, Chennai for facilities rendered.

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