Indian J. Vet. Med. Vol. 46, No. 1, 2026 pp. 41-42

Cerebrospinal Fluid Analysis in Dogs with Canine Distemper

**Bhavanam Sudhakara Reddy[1], Sirigireddy Sivajothi[2] and Dadireddy Naramda Raghavi[1]*
[1]Department of Veterinary Medicine; [2]Department of Veterinary Parasitology
Sri Venkateswara Veterinary University, Andhra Pradesh, India

Abstract

The aim of this study was to evaluate the cerebrospinal fluid examination findings in neurological form of canine distemper in naturally infected dogs. The study consisted 10 healthy dogs as control group and 10 dogs with neurological form of canine distemper virus. Confirmation of neurological form of canine distemper was done by assessing the neurological abnormalities, lack of vaccination history and further confirmed by commercially available rapid antigen diagnostic CDV test kit. Cerebrospinal fluid was collected from the cerebello-medullary cistern for physical, haemato-biochemical parameters. Cerebro spinal fluid examination in these animals showed the variations in specific gravity, higher red blood cells, leucocyte count, protein and glucose levels.

Keywords: Dogs, Canine distemper, Cerebro spinal fluid analysis

Dogs and other carnivore species are susceptible to a deadly and highly contagious disease caused by the canine distemper virus (Buragohain et al., 2017). Most often spread by oronasal aerosols, canine distemper can cause a variety of multisystemic clinical signs in affected dogs. This study describes cerebro spinal fluid analysis in dogs with canine distemper.

Table 1. Cerebrospinal fluid analysis in dogs with canine distemper with neurological signs

S. No	Parameters		Apparently healthy dogs (10)	Dogs with canine distemper with neurological signs (10)	t-test
1.	Appearance	Colourless	(10/10)	(40 %) 4/10	
		Straw colour		(60 %) 6/10	
2.	Consistency	Clear	(10/10)	(40 %) 4/10	
		Cloudy		(60 %) 6/10	
3.	Specific gravity	<1.005		(20 %) 2/10	
		1.005-1.010		(20 %) 2/10	
		>1.010		(60 %) 6/10	
4.	Total erythrocyte count /µL		0.11^{a} ±0.01 (0.33-1.46)	1.03^{b} ±0.01 (0.70-1.82)	3.88*
5.	Total nucleated cell count /µL		2.23^{a} ±0.78 (1.42-3.42)	5.08^{b} ±0.42 (2.81-8.94)	5.23*
6.	Total Protein (mg/dL)		21.01^{a} ±3.81 (19.54 -24.35)	35.44^{b} ±4.08 (24.23-66.08)	4.89*
7.	Albumin (mg/dL)		9.84^{a} ±0.72 (7.61 -12.72)	13.44^{b} ±2.05 (8.55-22.32)	2.07*
8.	Glucose (mg/dL)		60.81^{a} ±7.01 (54.23-79.03)	71.02^{b} ±5.08 (55.63-86.64)	1.82*

*Significant (P<0.05) Columns bearing different superscripts differ significantly.

*Corresponding author : bhavanamvet@gmail.com

https://doi.org/10.56093/ijvm.v46i1.167873

The study was conducted from 2023 to 2024 at the College of Veterinary Science, Proddatur, at the Department of Veterinary Medicine. Ten dogs with neurological form canine distemper were diagnosed during the one-year study period, and cerebrospinal fluid was obtained from each dog. The antigen rapid CDV Ag Test Kit was used to confirm the neurological form of canine distemper. Cerebello-medullary cistern was used to collect cerebrospinal fluid (Di Terlizzi and Platt, 2009) and color, consistency, and specific gravity were assessed. Additional haematological and biochemical parameters were evaluated, including total erythrocyte count and total leukocyte count; total protein, albumin and glucose (Kim et al., 2008).

Cerebrospinal fluid from ten dogs with nervous form of canine distemper was analysed, and the results are shown in Table-1. The physical characteristics of the cerebrospinal fluid included the following appearances: colourless in 40 percent (4/10) of cases, and straw-coloured in 60 (6/10). The consistency was clear in 40 percent (4/10) and cloudy in 60 percent (6/10). Specific gravity values were <1.005 in 20 percent (2/10), between 1.005 and 1.010 in 20 percent (2/10), and >1.010 in 60 percent (6/10). The laboratory parameters of cerebrospinal fluid in the dogs were total erythrocyte count with a mean of 1.03±0.01/µL (range: 0.70 to 1.82) total nucleated count with a mean of 5.08±0.42/µL (range: 2.81 to 8.94), the total protein level was 35.44±4.08 mg/dL (range: 24.33 to 66.08), albumin 13.44±2.05 mg/dL (range: 8.55 to 22.32) and glucose level 71.02±5.08 mg/dL (range: 55.63 to 86.64). Significant increases ($P<0.05$) were found total erythrocyte count, total nucleated cell count, total protein, albumin and glucose in these dogs. The total protein content of healthy CSF is much lower than that of plasma or serum due to the intact blood-brain barrier, which prevents large molecules from entering the subarachnoid space (Di Terlizzi and Platt, 2009).

Acknowledgement

Authors are thankful to Sri Venkateswara Veterinary University (SVVU) for providing facilities required to conduct the research.

References

Di Terlizzi, R. and Platt, S. R. 2009. The function, composition and analysis of cerebrospinal fluid in companion animals: Part II - Analysis. *Vet. J.,* **180(1):** 15–32.

Kim, I.H., Jung, D.I., Yoo, J.H., Kang, B.T., Park. C. and Park, H.M. 2008. Cerebrospinal fluid analysis in 13 clinically healthy Beagle dogs; Haematological, biochemical and electrophoretic findings. *Korean J. Vet. Res.,* **48**:105–110.

Received : 14.06.2025 **Accepted : 30.05.2026** **Published : 30.06.2026**