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## Studies on the incidence and haematobiochemical changes in canine epilepsy

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### Abstract

Epilepsy is one of the commonest disease conditions in dogs with characteristic clinical signs of episodic seizures. To find the incidence level of epilepsy on the aspects of age, sex, breed and season wise along with the evaluation of haematobiochemical values. Out of 2144 dogs observed 19 positive cases of epilepsy were found and an overall incidence of 0.88% was obtained. Eighteen dogs selected for the haematobiochemical study showed mean values in the normal range. Old dogs and male dogs having the higher incidence of epilepsy than the female. St. Bernard and Non-descript having the highest and lowest breed wise incidence respectively. The higher incidence of epilepsy showed by summer season with winter being the lowest.

**Keywords:** Epilepsy, incidence, seizure, haematobiochemical

### Introduction

Diseases and health problems of dogs are considered as important as that of humans nowadays. Empathetic dog owners with positive attitudes may be more aware of pain in their animal and readily respond to it (Ellingsen *et al.*, 2010) [3]. An epileptic seizure is “a transient occurrence of signs due to abnormal excessive or synchronous neuronal activity in the brain” (Fisher *et al.*, 2005) [5]. Seizure disorders occur frequently in dogs and having an incidence in the canine ranges from 0.5-5.7% of all dogs (Bollinger- Schmitz and Kline, 2000) [1]. A high frequency seizure may develop in many medium or large breeds of dogs like Border collie, Dalmatian, German shepherd, Golden retriever, Siberian husky, Saint Bernard (Ettinger and Feldman, 2010) [4]. When normal and no underlying cause of the seizure had been identified in routine serum biochemistry, haematology, CSF analysis, computed tomography (CT) or magnetic resonance imaging it is considered as Idiopathic epilepsy (Pakozdy *et al.*, 2008) [8]. The aim of the present study was to assess the incidence of epilepsy in the dogs along with the evaluation of haematobiochemical values.

### Materials and Methods

A total of 2144 dogs of 30 different breeds presented to the T.V.C.C College of Veterinary Science and Animal Husbandry, Mhow, (MP) were observed during the one year study period and among them 19 reported cases of epileptic condition recorded. The dogs for the study were selected on the basis of history and clinical signs like seizures, severe muscular tremor, convulsions and on the basis of severity, frequency and duration of seizures. History was taken including onset of clinical signs, time gap between two seizures, time period of the seizure, strength of the seizure, rectal temperature were also recorded.

Diagnosis was done on the basis of history and clinical signs showed by the animal. Differential diagnosis from the diseases like Canine distemper, role of neurotoxic agents, poisoning were done on the basis of history and clinical signs.

The incidence of epilepsy was calculated on the basis of dogs suffering from epilepsy during one year i.e. from March, 2017 to February, 2018

The incidence of epilepsy was calculated on the basis of following formula

$$\text{Incidence (\%)} = \frac{\text{Total No of dogs suffering from epilepsy per month}}{\text{Total No of dogs presented during that month}} \times 100$$

The incidence study was done on the basis of age, sex, breed of the dogs and seasons. Further, seasons were divided as follow:

Summer- March 2017 to June 2017

Rainy- July 2017 to October 2017

Winter- November 2017 to February 2018

Two ml of blood were collected in EDTA vials for haematological study and three ml of blood were collected in test tubes followed by serum separation by centrifugation after clotting for biochemical study. The study was conducted on 18 dogs suffering from epilepsy.

The haematobiochemical parameters like haemoglobin, packed cell volume (PCV), total leukocyte count (TLC),

differential leukocyte count (DLC), alanine transaminase (ALT) and serum creatinine were performed using automated machines Abacus- 380 and minichem 100 (with Erba Mannheim kit) for haematological and biochemical studies respectively.

### Results and Discussion

The mean values of haematobiochemical parameters viz. haemoglobin -15.99 g/dl, PCV-47.5%, TLC -13.48 thousand/ $\mu$ l, DLC - neutrophil-74.10% lymphocyte-22.22% monocyte-1.16% eosinophil-1.99% basophil- 0.10%, alanine transaminase (ALT) -38.53 IU/L and serum creatinine - 1.81mg/dl.

**Table 1:** Month wise incidence of epilepsy in dogs from March 2017- February 2018

S. No	Months	Total No. of dogs		Incidence (%)
		Observed	Suffered from epilepsy	
1.	March 2017	182	2	1.09
2.	April 2017	216	2	0.92
3.	May 2017	202	2	0.99
4.	June 2017	202	2	0.99
5.	July 2017	222	0	0
6.	August 2017	164	2	1.21
7.	September 2017	163	3	1.84
8.	October 2017	122	1	0.81
9.	November 2017	158	1	0.63
10.	December 2017	180	0	0
11.	January 2018	186	2	1.07
12.	February 2018	147	2	1.36
Overall Incidence		2144	19	0.88

In the current study out of 2144 dogs observed, an overall incidence of 0.88 % (19/2144) was reported, in which the highest incidence was reported at the month of September i.e. 1.84% (3/163) which was similar to the views of (Podell and Fenner, 1993) <sup>[9]</sup> reporting an incidence of 0.6% to 2.3 %.

Apart from the zero cases reported at the month of July and December, the number of epileptic cases presented to the T.V.C.C weren't varying that much showing a consistent incidence of epilepsy throughout the year.

**Table 2:** Age wise incidence of epilepsy in dogs

S. No	Age	Total No. of dogs		Incidence (%)
		Observed	Suffered from epilepsy	
1.	0 - 6 Months	729	3	0.41
2.	7 - 18 Months	421	7	1.66
3.	1.5 – 4 Years	493	6	1.21
4.	5 – 8 Years	301	1	0.33
5.	Above 8 years	200	2	1

An age wise incidence of epilepsy was calculated with a highest incidence of 1.66 % (7/421) in 7 to 18 months old dogs followed by an incidence of 1.21% (6/493) in 1.5 to 4 years old dogs was alike the study by (Berendt and Gram 1999) <sup>[2]</sup> stating most dogs with idiopathic epilepsy suffer

their first seizure between 1 and 5 years of age. The geriatric dogs had an incidence level of 1% (2/200) aged above 8 years old. The least incidence was reported in 5 to 8 year old dogs as 0.33 % (1/301) and next to that an incidence of 0.41% (3/729) for the 0 to 6 month aged pups.

**Table 3:** Sex wise incidence of epilepsy in dogs

S. No	Sex	Total No. of dogs		Incidence (%)
		Observed	Suffered from epilepsy	
1.	Male	1314	12	0.91
2.	Female	830	7	0.84

The current study revealed a higher incidence of epilepsy in male than in female as 0.91% (12/1314) and 0.84% (7/830)

respectively. Supportive to these (Heske *et al.* 2014) <sup>[6]</sup> noticed that, males were at a higher risk (1.4:1) than females.

**Table 4:** Breed wise incidence of epilepsy in dogs

S. No	Breeds	No. of dogs	Incidence (%)
1.	German Shepherd	526	6 (1.14%)
2.	Labrador	563	6 (1.06%)
3.	Non descript	386	2 (0.51%)
4.	Pomeranian	290	3 (1.03%)
5.	St. Bernard	69	2 (2.89%)

Among the 30 breeds observed, 5 breeds showed epileptic condition with a highest incidence in Saint Bernard (1.14%, (2/69)) followed by German Shepherd (1.14%, (6/526)), Labrador (1.06%, (6/563)), Pomeranian (1.03%, (3/290)), and Non descript (0.51%, (2/386)). Second to this (Jaggy and

Bernardini, 1998) [7] explained a breed pre-disposition for Labrador retrievers followed by crossbreeds, golden retrievers, German shepherd, Malinois, border collies, St Bernards and dachshunds.

**Table 5:** Season wise incidence of epilepsy in dogs

S. No	Seasons	Total No. of dogs		Incidence (%)
		Observed	Suffered from epilepsy	
1.	Summer	802	8	0.99
2.	Rainy	671	6	0.89
3.	Winter	671	5	0.74

A higher incidence of epilepsy was observed in the summer season as 0.99% (8/802) followed by rainy and winter with a calculated incidence of 0.89% (6/671) and 0.74% (5/671) respectively. This may be due to the level of stress animal goes through at the time of summer including dehydration and heat stroke.

### Summary

The study was conducted to know the incidence of epilepsy in case of dogs in various aspects like age, sex, breed and season and to evaluate haematobiochemical values at 0<sup>th</sup> day. Overall incidence level of 0.88% was obtained with a higher incidence in the 7- 18 month old dogs and male dogs having the higher incidence than the female. St. Bernard and Non-descript having the highest and lowest breed wise incidence respectively. The higher incidence of epilepsy showed by summer season with winter being the lowest. The heamatobiochemical values were in the normal range showing symptoms of idiopathic epilepsy.

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