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Prevalence study of renal diseases in dogs in and around Mhow region

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Abstract

The present study was carried out in the Department of Veterinary Medicine, Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Mhow (Madhya Pradesh). The dogs with history and signs like persistent vomiting, anorexia, dullness, hematemesis, melena, reduced or increased water intake, ascites etc. were selected for the prevalence study of renal diseases. During study, 70 dogs were diagnosed with clinical manifestations of renal failure in totally screened 1878 dogs. Prevalence study showed that the rate of kidney affections in canine is highest in December (5.58%) and among seasonal variations, post-monsoon season shows maximum number of kidney disease cases. along with above findings, dogs 5 year of age are more prone for developing renal failure with the incidence of 54.29%. Although gender predisposition revealed, male (61.43%) dogs are more prone to develop renal failure than female (38.57%) dogs.

Keywords: prevalence, kidney affections, renal failure, hematemesis, melena

1. Introduction

Kidneys as an extremely sophisticated, waste disposal system, which shorts non-recyclable waste from recyclable waste, 24 hours a day, 7 days a week, while also cleaning blood. The symptoms suggestive of renal failure like chronic vomiting and other symptoms of uremic gastritis along with changes in the urine output and dehydration were screened for the presence of chronic renal failure by serological ex-amination for uremia (Umesh *et al.*, 2011) [16]. The emergence of several infectious (*Ehrlichia canis*, *Babesia gibsoni* *Leptospira* sp, etc.) and metabolic diseases (diabetes) have further aggravated the incidence rate of renal disorders among dogs in India. Acute renal failure is considered to be one of the most prevalent complications of canine babesiosis. This complication leads to a decrease in the glomerular filtration rate and in consequence causes azotemia and uremia (Winiarczyk *et al.*, 2017) [17]. Kidney injury is a common complication of critical illness. The mortality rates associated with kidney injury are 50–60% in companion animals (De Mendonça *et al.* 2000; Small *et al.* 2012) [4, 14]. In spite of several advances in biomedical research and in our understanding of the pathogenesis of kidney injury, the management of kidney diseases remains a clinical challenge (Bellomo *et al.*, 2004). Early identification is extremely important to manage patients with renal disorders. However, there is a paucity of systematic epidemiological study on renal disorders. So the present study was designed with the objective of finding out age wise, breed wise, and season wise prevalence of renal diseases in dogs.

2. Material and Method

The present study was carried out in the Department of Veterinary Medicine, Veterinary Clinical Complex, College of Veterinary Science and Animal Husbandry, Mhow (Madhya Pradesh). The dogs presented to Veterinary Clinical Complex of College of Veterinary Science and Animal Husbandry Mhow, Government Veterinary Hospitals and private clinics of Mhow with history and signs like persistent vomiting, anorexia, dullness, hematemesis, melena, reduced or increased water intake, ascites etc. were selected for prevalence study. The prevalence of the renal disease was calculated on the basis of age, breed and sex of dog's month wise during October 2019 to March 2019 by the use of following equation.

Prevalence (%) = [Total no. of dogs positive for renal disease per month / Total no. of dogs present during that month.] X100

3. Result and Discussion

3.1 Prevalence

The study of prevalence helps to segregate the dogs that can develop renal failure and to get a clue to the general practitioners for further diagnosing and to adopt some precautionary measures for the dogs. The prevalence studies were performed as sex, age, breed and month wise to know

the prevalence of renal failure in dogs.

3.1.1 Prevalence (%)

During the period of the study, total 70 dogs were diagnosed with clinical manifestations of renal failure, out of total 1878 numbers of dogs screened (Table 1).

Table 1: Over all prevalence of renal diseases in dogs

S. No.	Total no. of dog presented during study period	No. of dogs positive for renal diseases	Prevalence (%)
1	1878	70	3.73%

This finding is similar to those reported by Sharma, (2014) [12] at Veterinary College, Mhow (M.P.) they observed that incidence of renal diseases was 3.2%. Similar findings were also reported by Kandula and Karlapudi (2014) [6], Tufani *et al.* (2015) and Bhojne *et al.* (2016).

3.1.2 Sex wise prevalence

Out of the 70 dogs, male dogs 43(61.42%) were found to be more affected than female dogs 27(38.57%) (Table 2).

Table 2: Sex wise prevalence of renal diseases in dogs

Sex	No. of dogs positive for renal diseases	Prevalence (%) n=1878	No. of dogs positive for renal diseases	Prevalence (%) n=70
Male	43	2.29	43	61.43
Female	27	1.44	27	38.57

These observations were found to be similar with the findings of Behrend *et al.* (1996) [2] he reported that the incidence rate of renal failure was greater in the male when compared to female dog. Oburai *et al.* (2015) [9] observed that males were found to be more affected than in females. However, it was in contrast with the findings of Kandula and Karlapudi (2014) [6] and Mukharjee *et al.* (2014) [8] wherein they found that the prevalence was more females as compared to the males. In the present study, higher numbers of males were found to be affected which could be attributed to the fact that preference of the owners of Mhow city to rear males is more compared to that of the females. Further, in dogs, the kidney size and weight is more in males than in females due to higher proximal tubular volume and it is a well-known fact that males have higher blood pressure as that compared to the

females which might also be one of the reasons for its higher prevalence. Additionally, the male dogs have a long urethra and os penis bone, thereby the affections of the lower urinary system are more in males as compared to the females.

3.1.3 Age wise prevalence (%)

The highest prevalence was found in dogs having age of 5-10 years followed by dogs belonging to 18 months to 5 years. Out of the total number of dogs screened, 1(1.4%) dogs belonged to the age group of up to 6 months, 3(4.28%) belonged to age group of 6 months to 18 months, 17(24.29%) from 18 months to 5 years, 38(54.25%) up to 10 years age group and 11(15.71 %) belonged to more than 10 years (Table 3).

Table 3: Age wise prevalence of renal diseases in dogs

Age	No. of dogs positive for renal diseases	Prevalence (%) n=1878	No. of dogs positive for renal diseases	Prevalence (%) n=70
0-6 months	1	0.05	1	1.43
6-18 months	3	0.16	3	4.29
18months – 5 years	17	0.91	17	24.29
5-10 years	38	2.02	38	54.29
>10 years	11	0.59	11	15.71

These findings were consistent with the findings of MacDougall *et al.* (1986) [7], Srinivasan *et al.* (1993) [13], Polzin *et al.* (2005) [10], Kandula and Karlapudi (2014) [6] and Oburai *et al.* (2015) [9] who reported that the incidence was more in geriatric dogs above the age of 7 years. During the study, 5 to 10 years aged dogs were found to be much more prevalent for renal failure because as the age advances, the blood flow to the kidney decreases and the functional nephrons of the kidney also decrease in numbers. However, older dogs often have other age related disease processes that

might have a role in the development of renal failure.

3.1.4 Breed wise prevalence (%)

During the present study, Labrador breed was found to be most affected 24(34.28%), followed closely by Pomeranian 13(18.57%), Mixed breed dogs /indigenous 11(15.71%), German shepherd 9(12.85%), St. Bernard 4(5.70%), Rottweiler 3(4.20%), Pug and Boxer were found equally prevalent at 2(2.85 %) (Table 4).

Table 4: Breed wise prevalence of renal diseases in dogs

Breeds	Dogs positive for renal diseases	Prevalence (%) n=1878	Dogs positive for renal diseases	Prevalence (%) n=70
Labrador	24	1.28	24	34.29
Pomeranian	13	0.69	13	18.57
Indigenous	11	0.59	11	15.71
German shepherd	09	0.48	09	12.86
St. Bernard	04	0.21	04	5.71
Rottweiler	03	0.16	03	4.29
Pug	02	0.11	02	2.86
Boxer	02	0.11	02	2.86

These findings were consistent with the findings of Kandula and Karlapudi (2014) [6], and Ahmed (2011) [1] where they observed that the incidence was highest in Labrador breed. The present findings were also in accordance with Saravanan *et al.* (2012) who documented high prevalence of renal failure among Labrador breeds. But the findings were in contrary to the findings of Oburai *et al.* (2015) [9] he reported the incidence to be highest in Spitz breed. The higher prevalence in Labrador breed in the present study could be due to the fact that this particular breed is prone to pyometra, leptospirosis and other systemic conditions and the relative difference of the distribution of this breed in the present area. Some breeds are also known to carry familial recessive genes that cause renal failure and can be passed through the offspring. The relative difference with breed wise prevalence of renal disorders might be due to distribution of a particular breed in the geographical area (Mhow) where the present study was carried out.

3.1.5 Month wise prevalence (%)

Highest prevalence rate was recorded in the month of December 13(5.57%) followed by November 12(4.49%), and lowest in the month of February 7(2.32%) (Table 5).

Table 5: Month wise prevalence of renal diseases in dogs

Month	Dogs presented at VCC n=1878	No. of dogs positive for renal diseases n=70	Prevalence (%)
September	257	8	3.11
October	314	9	2.87
November	267	12	4.49
December	233	13	5.58
January	344	15	4.36
February	301	7	2.33
March	162	6	3.70

These findings were supported with the findings of Karunanithy *et al.* (2019) [5] in which incidence rate of renal disorders was found to be highest in the month of December (5.79%), while the incidence rate was found to be lowest in month of February (0.74%). High incidence rate may be due to less water intake in the peak winter months, leading to decreased flushing of toxins from body and ultimately resulting in uremia. Among various seasons, incidence rate was found to be lowest in rainy season and highest in post-monsoon season.

4. Conclusions

Prevalence study concluded with rate of kidney affections in canine is highest in month of December (5.58%) and among seasonal variations, post-monsoon season shows maximum number of kidney disease cases. Dogs 5 year of age are at higher risk for developing renal failure with the incidence of 54.29%. Although gender specificity study revealed, male

(61.43%) dogs are more prone to develop renal failure than female (38.57%) dogs.

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