



ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.03
TPI 2020; SP-9(12): 06-07
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www.thepharmajournal.com
Received: 19-09-2020
Accepted: 08-11-2020

Y Chaitanya

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

N Lakshmi Rani

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

V Vaikunta Rao

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

P Ravi Kumar

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

Makkena Srinu

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

Corresponding Author:

Y Chaitanya

Department of Veterinary
Medicine, NTR College of
Veterinary Science, Gannavaram
Sri Venkateswara veterinary
University, Tirupati, Andhra
Pradesh, India

Epidemiological studies of renal diseases in dogs

Y Chaitanya, N Lakshmi Rani, V Vaikunta Rao, P Ravi Kumar and Makkena Srinu

Abstract

The present study was aimed to record the occurrence of renal diseases in dogs. Overall occurrence of renal diseases was 3.48% (318/9347). Out of 318 affected dogs, 58 (18.24%) suffered with acute kidney injury, whereas 260 (81.76%) were of chronic kidney disease. The age wise occurrence of kidney disease was found to be higher in dogs aged above 8 years (47.48%) followed by dogs aged in between 4-8 years (30.82%) and was less in dogs below 4 years age (21.70%). Breed wise occurrence was higher in Pomeranian (30.82%) followed by Labrador retriever (17.92%), Mongrel (15.09%).

Keywords: Occurrence, renal diseases, dogs, age, breed, gender

Introduction

Renal disease in dogs is third leading cause of death and about 2-5 % of dogs suffer with renal disease (Lund *et al.*, 1994)^[1]. This might be due to increased urbanization and environmental pollution, unscientific feeding and indiscriminate use of therapeutic agents (Katoch *et al.*, 2018)^[2]. The variations in the occurrence could be due to several extrinsic factors like variations in geographical, environmental and manage mental practices or differences in sample size. Detailed reports of occurrence of renal diseases in dogs in Andhra Pradesh are lacking. Hence, the present study was conducted to record the occurrence of renal diseases in dogs that were presented to the Veterinary Clinical Complex, NTR College of Veterinary Science, Gannavaram.

Materials and Methods

Total 9,347 dogs were screened for renal disease at Gannavaram during the period March 2018 to March 2020. Preliminary Screening of dogs for diagnosing renal disease was based on the dogs history, physical and clinical examination and urinalysis. Further, Haemoto biochemical, imaging (radiology and nephrosonography) and histopathological studies were used for confirmatory and differential diagnosis of renal disease. Statistical analysis was done using SPSS (20.0) software using standard techniques (Snedecor and Cochran 1994)^[3]

Results

A total of 9,347 dogs were registered at VCC, Gannavaram. Out of these, 528 dogs were suspected for kidney diseases on the basis of history and clinical signs and were subjected to haemato-biochemical profile, urinalysis and imaging studies for further confirmation. In the present study, 318 dogs were confirmed with kidney diseases, thus representing an occurrence of 3.40 per cent. Out of 318 affected dogs, 58 (18.24%) suffered with acute kidney injury, whereas 260 (81.76%) were of chronic kidney disease.

The age wise occurrence of kidney disease was found to be higher in dogs aged above 8 years (47.48%) followed by dogs aged in between 4-8 years (30.82%) and was less in dogs below 4 years age (21.70%). The occurrence of acute kidney injury was higher in dogs aged between 4-8 years (46.55%) followed by 29.31 per cent in dogs aged below 4 years and 24.14 per cent in dogs above 8 years of age. Higher occurrence of chronic kidney disease was noticed in dogs aged above 8 years (52.69%) followed by 4-8 years (27.31%) and less in dogs aged below 4 years (20.00%).

Out of 318 dogs affected, 35.85 per cent (114/318) were male and 64.15 per cent (204/318) were female. Acute kidney injury was recorded in (62.07%) of the male dogs and (37.93%) of female dogs, where as the occurrence of chronic kidney disease was more in female (70.00%) than in male dogs (30.00%).

The breed wise occurrence was higher in Pomeranian (30.82%) followed by Labrador retriever

(17.92%), Mongrel (15.09%), Belgian Shepherd (11.95%), German Shepherd (10.38%), Pug (4.72%), Dachshund (3.77%), Rotweiler (1.89%), Dobermann (1.89%), St. Bernard (0.63%) and Dalmatian (0.94%). Among dogs with acute kidney injury, higher occurrence was recorded in Mongrel (27.59%) followed by Labrador (18.97%), German shepherd (15.52%), Pomeranian (13.79%), Pug (10.34%), Dachshund (8.62%) and Rotweiler (5.17%). Chronic kidney disease was more in Pomeranian (34.62%), followed by Labrador (17.69%), Belgian Shepherd (14.62%), Mongrel (12.31%), German Shepherd (9.23%), Pug (3.46%), Dachshund (2.69%), Dobermann (2.31%), Dalmatian and Rotweiler (1.15%) each and St. Bernard (0.77%).

Table 1: Age wise occurrence of renal diseases in dogs

S.No	Age group	Number of dogs affected	AKI(n=58)	CKD(n=260)
1	Up to 4 years	69(21.70%)	17(29.31%)	52(20.00%)
2	>4-8 years	98(30.82%)	27(46.55%)	71(27.31%)
3	>8 years	151(47.48%)	14(24.14%)	137(52.69%)
	Total	318(100%)	58(100%)	260(100%)

*Figures in parenthesis indicates percentage

Table 2: Gender wise occurrence of renal diseases in dogs

S.No	Gender	Number affected	AKI(n=58)	CKD(n=260)
1	Male	114(35.85%)	36(62.07%)	78(30.00%)
2	Female	204(64.15%)	22(37.93%)	182(70.00%)
	Total	318(100%)	58(100%)	260(100%)

*Figures in parenthesis indicates percentage

Table 3: Breed wise distribution of kidney diseases in dogs (n=318)

S.No	Name of breed	Number affected	AKI(n=58)	CKD(n=260)
1	Mongrel	48(15.09%)	16(27.59%)	32(12.31%)
2	German Shepherd	33(10.38%)	9(15.52%)	24(9.23%)
3	Labrador	57(17.92%)	11(18.97%)	46(17.69%)
4	Pomeranian	98(30.82%)	8(13.79%)	90(34.62%)
5	Belgian shepherd	38(11.95%)	-	38(14.62%)
6	Dachshund	12(3.77%)	5(8.62%)	7(2.69%)
7	Pug	15(4.72%)	6(10.34%)	9(3.46%)
8	Rotweiler	6(1.89%)	3(5.17%)	3(1.15%)
9	Dobermann	6(1.89%)	-	6(2.31%)
10	St. Bernard	2(0.63%)	-	2(0.77%)
11	Dalmatian	3(0.94%)	-	3(1.15%)
	Total	318(100%)	58(100%)	260(100%)

*Figures in parenthesis indicates percentage

Discussion

The occurrence of CKD was higher in the present study and was attributed to the progressive nature of CKD with structural or functional abnormalities of kidney that were present for long duration. Further, AKI might be under diagnosed in majority of cases as causes are multifactorial with rapid loss of nephron function and may progress to chronic in some cases (Brown *et al.*, 2015) [4]. The occurrence of acute kidney injury was more in dogs aged between 4-8 years while chronic kidney disease was noticed to be higher in dogs aged above 8 years. These findings commensurate with the observations of Devipriya *et al.* (2018) [5] who opined that CKD was more common in aged dogs which were above 8 years and could be due to loss/impairment of nephrons with advancement of age. The higher occurrence of AKI in middle

aged dogs could be attributed to greater incidence of infections (Badesiya, 2016) [6].

The gender wise occurrence of AKI was higher (62.07%) in male dogs while it was 37.93 per cent in female dogs. This could be due to more risk associated with urolithiasis in male than the female due to several anatomical and endocrine variations (Bjorling, 2003) [7]. Higher occurrence of CKD in females (70.00%) than in male dogs (30.00%) of the present study was in agreement with the findings of Kumar *et al.* (2009) [8] and Srikanth and Kumar (2015) [9] who opined that various unhygienic management practices during puerperal stage might predispose to genital infections and progress as urogenital conditions such as cystitis and pyometra which in turn affect the kidney function.

Among the breed wise occurrence, majority were recorded in Pomeranian (30.82%) followed by Labrador (17.92%) and less in St. Bernard (0.63%) and Dalmatian (0.94%). The relative breed wise differences of renal disorders in the present study might be due to more distribution of a particular breed in the geographical area and variations in the managemental practices. Pomeranian were found to be more vulnerable to urethritis, urolithiasis, cystitis and other systemic conditions, whereas Labradors were more prone to pyometra, leptospirosis and other systemic conditions (Tufani *et al.*, 2015) [10].

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