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Clinical analysis: The incidence and demographic profile of chronic kidney disease in canines of Bengaluru in 2025

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Abstract

Chronic Kidney Disease (CKD) represents a significant challenge in small animal practice as the renal pathology already has set in and the illness is only a managerial one. Clinical symptoms are often vaguely represented and pet owners usually confuse them to a common gastrointestinal disease. This study investigates the incidence and clinical distribution of CKD in a cohort of 38 dogs among 17,721 cases presented in a six-month period. By analysing age, sex, breed, and IRIS (International Renal Interest Society) staging, this article identifies high-risk demographics and emphasizes the critical need for early diagnostic intervention. Findings indicate a strong correlation to advanced age, particularly among Labrador Retrievers and male patients.

Keywords: Incidence, old age, early intervention, Chronic Kidney Disease (CKD)

1. Introduction

International Renal Interest Society (IRIS) classified CKD into four progressive stages based on serum creatinine and Symmetric dimethyl arginine (SDMA) values and further using values of systemic blood pressure and proteinuria to subclassify the stages: for ease of diagnosis and staging, treatment selection and prognosis. Numerous clinically affected dogs, present at various stages eventually meeting at the terminal uraemic phase.

The objective of this study was to map the incidence of CKD within a specific patient population to better understand which dogs are most vulnerable. By identifying these factors, practitioners can refine their senior wellness-protocols to check kidney disease early.

2. Materials and Methods

The current study was carried out in dogs presented to the Veterinary College Hospital, Department of Veterinary Medicine, Veterinary College, Hebbala, Bengaluru during the period, January 2025 to June 2025. Dogs presented with clinical symptoms suggestive of renal involvement like cachexia, lethargy, intermittent inappetence and vomiting, halitosis and other associated signs for more than three months or with a previous history of elevated renal markers for more than three months were segregated. These dogs were then subjected to detailed physical examination, blood pressure assessment, haematology, serum biochemistry, urinalysis and ultrasonographic evaluation for the confirmation of CKD.

3. Results and Discussion

A total of 17,721 cases of dogs were presented to the Outpatient Unit, Veterinary College Hospital, Department of Veterinary Medicine, Veterinary College, Bengaluru during January 2025 to June 2025. Out of the total cases presented, 158 cases of dogs were diagnosed for renal dysfunction. In the present study, overall occurrence of renal dysfunction was 0.89 percent in dogs. Out of 158 cases presented as renal dysfunction, 75.95 percent (120 dogs) were diagnosed with acute kidney injury (AKI) and 24.05 percent (38 dogs) were diagnosed

with chronic kidney disease (CKD). In the present study, overall occurrence of AKI was 0.68 percent and that of CKD, 0.21 percent.

3.1 Age-wise occurrence of CKD in dogs

In the present study among the 38 dogs evaluated for chronic kidney disease (CKD), age-wise distribution across IRIS stages and age groups revealed a marked predominance of cases in older animals. Dogs which were aged more than 8 years constituted the largest subgroup ($n = 23$; 60.52%), with the majority presenting in Stage-IV ($n = 10$), followed by Stage-II ($n = 6$), Stage-III ($n = 5$) and Stage-I ($n = 2$). In contrast, younger age groups showed fewer cases and milder staging: dogs aged 0–4 years ($n = 4$; 10.53%) were distributed across Stage-I ($n = 1$), Stage-II ($n = 2$), and Stage-III ($n = 1$), with no representation in Stage-IV; similarly, dogs aged 4–6 years ($n = 4$; 10.53%) were confined to Stage-I and Stage-II ($n = 2$ each). The 6–8-year age group ($n = 7$; 18.42%) showed a gradual shift toward advanced disease, with Stage-IV cases

($n = 3$) and Stage-III cases ($n = 2$) becoming more prominent. The overall occurrence of CKD was found highest in the age group of 8 years and above (23/38, 60.52%) followed by 6 to 8 years (7/38, 18.42%) and least in 4 to 6 years (4/38, 10.53%) and 0 to 4 years (4/38, 10.53%). Details are depicted in Table 1 and figure 1. These findings are in strong accordance with the results reported by Gupta *et al.* (2024) [2], who found an almost identical incidence of 63.6% in dogs greater than eight years old, and O'Neill *et al.* (2013) [4], who reported the highest incidence (63.6%) in dogs aged 12 years and older. This alignment with multiple studies reinforces the conclusion that advanced age is a primary risk factor for CKD. Similarly, Thade *et al.* (2019) [6] also identified older dogs as the most affected population, with over 85% of their cases occurring in dogs over five years old, though their cohort was more evenly split between the 5-10 year and greater than 10-year age groups.

Table 1: Age-wise occurrence of CKD in dogs

Sl. No.	Age of the animal	IRIS staging				Total (n=38)
		Stage-I	Stage-II	Stage-III	Stage-IV	
1.	0 - 4 years	1	2	1	0	4 (10.53)
2.	4 - 6 years	2	2	0	0	4 (10.53)
3.	6 - 8 years	1	1	2	3	7 (18.42)
4.	8 years and above	2	6	5	10	23 (60.52)
Total		6 (15.80)	11 (28.94)	8 (21.05)	13 (34.21)	38 (100)

Figures in parenthesis indicate percentages

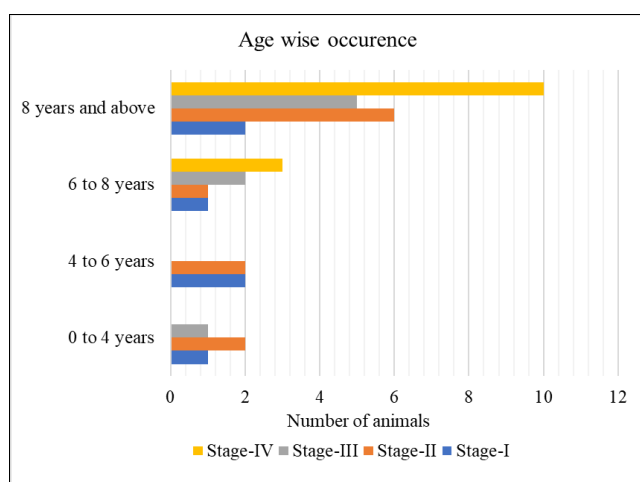


Fig 1: Age-wise occurrence of CKD in dogs

The findings of the present study are not in agreement with Chawla *et al.* (2020), who also reported highest incidence in dogs older than eight years (33%), but reported a surprisingly high and nearly equal prevalence in the two-to-five-year age group (32%). This is a notable disagreement, as the current study found a low incidence of just 10.53% in the comparable 0–4-year age group. Furthermore, current results directly disagree with those of Venkatesh *et al.* (2024) [7], who reported the highest incidence (27.69%) in a much younger, middle-aged group of 4-6 years, with the >8 years group following at 26.1%.

The evidences from the present study, supported by a majority of the cited literature, firmly establishes CKD as a condition with a strong geriatric predisposition in dogs. It can be attributed to differences in the study population's breed predispositions, regional environmental factors, referral biases, or the prevalence of congenital/juvenile nephropathies in their specific sample groups. Also, a lifetime of exposure to

potential nephrotoxins, infections, and haemodynamic changes can lead to a gradual and progressive loss of nephrons. An age-related decline in the glomerular filtration rate (GFR) is a known phenomenon. Older dogs also have a higher likelihood of suffering from concurrent conditions. Finally, advancing age is the single most significant non-modifiable risk factor for the development and progression of CKD in dogs.

3.2 Gender-wise occurrence of CKD in dogs

In the present study, among the 38 dogs diagnosed with chronic kidney disease (CKD), gender-wise distribution across IRIS stages revealed that male dogs ($n=22$; 57.89%) were predominantly represented in Stage-IV ($n = 9$), followed by Stage-II ($n = 5$), Stage-III ($n = 4$), and Stage-I ($n = 4$), whereas female dogs ($n = 16$; 42.11%) showed a higher representation in Stage-II ($n = 6$), with fewer cases in Stage-IV ($n = 4$), Stage-III ($n = 2$), and Stage-I ($n = 2$). Details are depicted in Table 2 and figure 2. The findings of a male predisposition are in strong agreement with several other studies (Thade *et al.*, 2019; Gupta *et al.*, 2024; Venkatesh *et al.*, 2024) [2,6,7], which also saw a higher prevalence in males. However, current results contradict other major studies (O'Neill *et al.*, 2013; Lippi *et al.*, 2021) [3,4], both of which found a nearly equal occurrence in both the genders.

The higher percentage of dogs presented as males may be due to the preference of rearing male dogs more often and roaming nature of male dogs for territory marking, exposure to toxins and infectious agents; which may be the cause why males were presented more (Figure2).

Table 2: Gender-wise occurrence of CKD in dogs

Sl. No.	Gender	IRIS Staging				Total (n=38)
		Stage-I	Stage-II	Stage-III	Stage-IV	
1.	Male	4	5	4	9	22 (57.89)
2.	Female	2	6	2	4	16 (42.11)

Total	6 (15.80)	11 (28.94)	8 (21.05)	13 (34.21)	38 (100)
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Figures in parenthesis indicate percentages

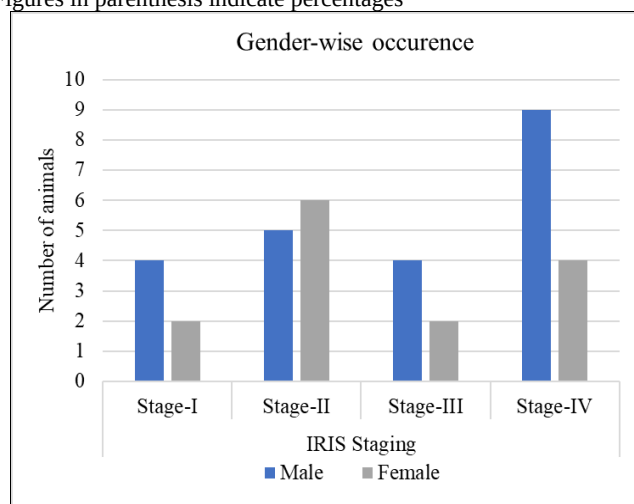


Fig 2: Gender-wise occurrence of CKD in dogs

3.3 Breed-wise occurrence of CKD in dogs

In the present study, the overall occurrence of CKD was highest in Labrador Retriever (12/38, 31.58%) followed by Pomeranian (7/38, 18.42%), non-descript (6/38, 15.80%), Golden Retriever (4/38, 10.52%); Shit Tzu, Siberian Husky and Rottweiler presented the same (2/38, 5.26%); Cocker Spaniel, Pug and American Bully presented the same (1/38, 2.63%). Breed wise distribution across IRIS stages are depicted in Table 3 and figure 3.

Table 3: Breed-wise occurrence of CKD in dogs

Sl. No.	Breed	IRIS staging				Total (n=38)
		Stage-I	Stage-II	Stage-III	Stage-IV	
1.	Labrador Retriever	2	3	3	4	12 (31.58)
2.	Pomeranian	0	2	1	4	7 (18.42)
3.	Non-descript	0	2	2	2	6 (15.80)
4.	Golden Retriever	1	2	1	0	4 (10.52)
5.	Shit Tzu	1	0	0	1	2 (5.26)
6.	Siberian Husky	1	1	0	0	2 (5.26)
7.	Rottweiler	0	1	0	1	2 (5.26)
8.	Cocker Spaniel	0	0	1	0	1 (2.63)
9.	Pug	0	0	0	1	1 (2.63)
10.	American Bully	1	0	0	0	1 (2.63)
	Total	6	11	8	13	38 (100)

Figures in parenthesis indicate percentages

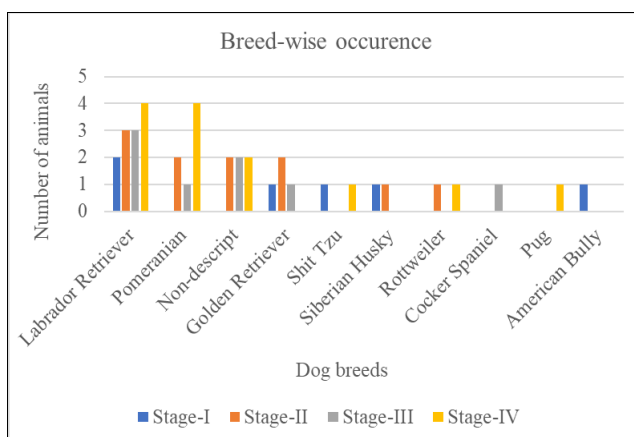


Fig 3: Breed-wise occurrence of CKD in dogs

who, in a large study, also identified non-descript, Labrador Retrievers, and Pomeranians as the top three most affected groups, albeit with non-descript having the highest prevalence. The high representation of Labrador Retrievers, Pomeranians, and non-descript dogs is further corroborated by Reddy *et al.* (2021) ^[5] who also listed these breeds among the most prevalent in his study. Ahmad *et al.* (2023) ^[1] similarly reported Labradors as having a high incidence of renal disorders.

The current study findings were in disagreement with Venkatesh *et al.* (2024) ^[7] who found the German Shepherd to be the most affected breed in their cohort (21.54%), a breed that did not feature prominently in the current study's top affected breed list.

Rearing of certain breeds of dogs like Labrador Retrievers can reflect their high representation in the general population rather than a disproportionately higher intrinsic risk. Regional differences in breed popularity and local genetic pools like German Shepherds which were at higher occurrence for CKD in other studies, can also cause discrepancies in the result. The results also suggest that the higher presented breeds should be routinely screened for renal biomarkers for earlier diagnosis and intervention in renal health.

3.4 Stage-wise occurrence of CKD in dogs

In the present study, highest occurrence was in Stage-IV (13/38, 34.21%) followed by Stage-II (11/38, 28.94%), Stage-III (8/38, 21.05%) and Stage-I (6/38, 15.80%). Details are depicted in Table 4 and figure 4. The current findings are in accordance with Sonu *et al.* (2019), who also documented the highest prevalence in Stage-IV (58.3%) and the lowest in Stage-I (4.16%), showing a clear pattern of presentation after the onset of severe disease. Similarly, Venkatesh *et al.* (2024) ^[7] reported Stage-IV as the most common presentation at a nearly identical percentage (32.3%) to the current study. Conversely, the results of the current study differ from those of Lippi *et al.* (2021) ^[3], who found Stage-II (47.9%) to be the most frequent stage at diagnosis.

Observation of pets, good rearing practices and routine screening may have underscored the current study results which may have led to higher presentation of dogs in end stage renal disease.

Table 4: Stage-wise occurrence of CKD in dogs

Sl. No.	CKD stage	Number of animals (n)	Percentage (%)
1.	Stage-I	6	15.80
2.	Stage-II	11	28.94
3.	Stage-III	8	21.05
4.	Stage-IV	13	34.21
	Total	38	100

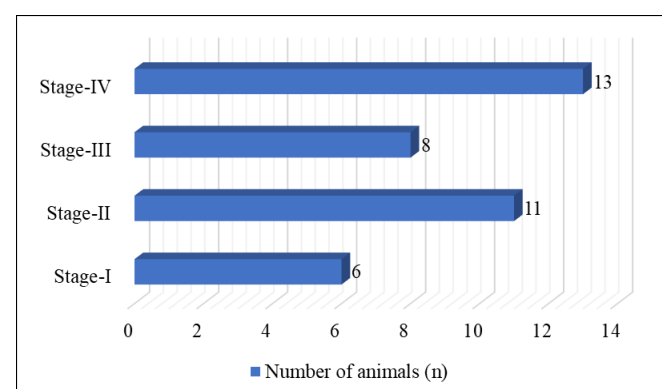


Fig 4: Stage-wise occurrence of CKD in dogs

These results are in accordance with Thade *et al.* (2019) ^[6],

5. Conclusion

CKD is most common in dogs aged eight years and older, accounting for 60.52% of cases. Males were more frequently affected than females (nearly 58% of cases) and presented in more advanced stages of the disease. The Labrador Retriever was the most affected breed, representing 31.58% of all cases. The highest proportion of cases were identified in the most severe stage, IRIS Stage-IV (34.21%). This study pressed on the need for routine testing of blood and urine with better managemental practices in senior dogs to prevent kidney diseases on knowing the demographic profile.

Conflict of Interest

Not available

Financial Support

Not available

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