SHORT COMMUNICATION

Canine Renal Failure: A Clinical Prevalence Study

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Abstract

A prospective study was conducted to determine the prevalence of renal failure in dogs presented to veterinary hospitals in North Karnataka and the distribution of renal failure based on age, breed, and gender was recorded at Veterinary Clinical Complexes in Bidar and Gadag. The overall occurrence of renal failure was recorded as 0.72 % among total clinical cases (13375) at Veterinary Clinical Complexes in Bidar and Gadag. District-wise analysis revealed an overall prevalence of 0.92 %, with the highest in Belagavi (1.11%) and lowest in Yadagir (0.60%). Age-wise evaluation indicated that dogs between 5-10 years were most affected (47.42%), followed by 2-5 years (30.93%), >10 years (12.37%), and <2 years (9.28%). Breed-wise prevalence showed a higher incidence in Labrador Retrievers (37.11%) and German Shepherds (24.74%), with lower occurrence in other breeds. A higher prevalence was in males (56.70%) compared to females (43.30%). Therefore, renal failure in dogs in North Karnataka shows moderate prevalence with significant variation across districts and is influenced by age, breed, and gender. These findings highlight the importance of early diagnosis and targeted management strategies in high-risk groups.

Keywords: Age, Breed, Canine, Gender, Prevalence, Renal failure.

Ind J Vet Sci and Biotech (2026): 10.48165/ijvsbt.22.5.33

Introduction

Renal failure in dogs represents a significant clinical challenge in veterinary medicine, affecting approximately 0.50 to 1.50 % of the canine population (Brown *et al*., 2007; Polzin, 2011). It is the second leading cause of non-accidental deaths in dogs, more common in older dogs of over 8 years of age (Ahmed, 2011) and the genetic predisposition for renal disorders was more in the pure breeds dogs (Fogle, 2002). The prevalence of renal disease was higher in males when compared to females (Thade *et al.*, 2019). While improvements in diagnostic technology and heightened owner awareness have facilitated more frequent identification of this condition, comprehensive data regarding its prevalence across diverse regions of the country remains scarce. Consequently, this clinical survey was initiated to document the occurrence of canine renal failure in the parts of North Karnataka, India.

Materials and Methods

For prospective prevalence study, dogs presented to Department of Veterinary Clinical Complex, Veterinary College, Bidar and Gadag, Karnataka (India) and dogs referred from surrounding government hospitals as well as by private practitioners from various parts of Karnataka with a history of renal failure from August 2023 to July 2025 were considered for the present study and for retrospective prevalence study, hospital records of various pet clinics of 13 districts of North Karnataka were scrutinized for a period from January 2022 to December 2024 (3 years) to know the incidence of renal failure in dogs. Data were analysed using percentage calculation method.

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How to cite this article: Panchasheel, Kasaralikar, V. R., Patil, N. A., Dilipkumar D., Sandeep, H., & Sarangmath, S. P. (2026). Canine Renal Failure: A Clinical Prevalence Study. Ind J Vet Sci and Biotech, 22(5), 174-176.

Source of support: Nil

Conflict of interest: None

Submitted 05/01/2026 **Accepted** 20/02/2026 **Published** 10/09/2026

Results and Discussion

Prevalence of Renal Failure

The results of present prospective study revealed that occurrence of renal failure was 0.72 % (Table 1) among the total number of clinical cases of dogs (13375) presented to the two different hospitals, *viz.*, Veterinary Clinical Complex, Veterinary College, Bidar and Gadag, the prevalence being little higher in VCC, Bidar (0.78%) than in VCC, Gadag (0.65%). The result of the present investigation was in close agreement with the prevalence rates of 0.50 to 1.50 % in earlier reports of Brown *et al*. (2007) and Polzin (2011). Similar prevalence rate of 0.05-3.74 % was also recorded by O'Neill *et al.* (2013).

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The prevalence of renal failure recorded in 13 districts of North Karnataka varied from 0.60 to 1.11 %, with an overall prevalence of 0.92 % (Table 2).

Table 1: Overall prevalence of renal failure in dogs

Dogs presented to VCC (Aug 2023 to July 2025)		No. of renal failure cases	Prevalence (%)
Bidar	7660	60	0.78
Gadag	5715	37	0.65
Total	**13375**	**97**	**0.72**

Table 2: Prevalence of renal failure in dogs in the districts of North Karnataka from January 2022 to December 2024 (3 years)

Name of the district	No. presented to the polyclinics	No. of renal failure dogs	Prevalence (%)
Belagavi	16369	181	1.11
Kalaburagi	12339	112	0.91
Dharwad	9676	101	1.04
Koppal	10333	97	0.94
Raichur	11446	96	0.84
Ballari	10112	89	0.88
Bidar	8448	85	1.01
Gadag	7898	77	0.97
Haveri	8103	72	0.89
Vijayapura	7369	65	0.88
Bagalkot	6990	61	0.87
Vijayanagara	6796	55	0.81
Yadagiri	6467	39	0.60
Total	**122346**	**1130**	**0.92**

Age-wise Prevalence

Analysis of the present data further indicated that the prevalence of renal failure was highest in the dogs aged between 5 to 10 years (n=42/97, 47.42%) followed by dogs aged between 2-5 years (n=30/97, 30.93%) and dogs older than 10 years of age (n=12/97, 12.37%). The incidence was least in the dogs less than 2 year of age (n=9/97, 9.28%). This was in close agreement with earlier reports of Mallela *et al*. (2006), Sahiba (2013) and Tufani *et al*. (2015). Contrary to this Levey *et al*. (2003) regarding the age-related increase of renal damage revealed that, the renal failure also affects younger and middle-aged dogs, rather than being a strictly geriatric concern. Higher risk of renal failure associated with aged dogs could be due loss of nephron with the advancement of age. Excessive intake of protein rich diets may also lead to degeneration of nephrons and ultimately renal insufficiency in dogs (Polzin *et al*., 1991). Another reason in middle aged dogs is the various systemic causes like cardiovascular, hepatic abnormalities and diabetes mellitus also responsible for renal damage, due to hypo-perfusion, renal ischemia and nephrosis (Sato *et al*., 2002; Remzi *et al*., 2009).

Breed-wise Prevalence

The breeds most commonly affected were Labrador Retriever (n=36, 37.11%) followed by German Shepherd (n=24, 24.74%) and Golden Retriever (n=7, 7.22%). Doberman Pinscher, Great Dane and Shih Tzu showed an equal prevalence of 4.12 (n=4) % each. The lesser and similar prevalence was recorded in Pomeranian, Local non-descript, Pug and Siberian Husky at 3.09 (n=3) % each and the lowest prevalence was recorded in Rottweiler, Mudhol Hound and Dalmatian at 2.06 (n=2) % each. The prevalence of renal failure appears to be disproportionately higher in specific breeds, which may be influenced by regional popularity, notably in Labradors and German Shepherd Dogs (GSD). As noted in present investigation, this prevalence is also likely driven by a variety of proven or suspected hereditary and familial kidney diseases. Fogle (2002) reported that genetic predisposition for renal disorder is more in the pure breed dogs. Ahmed (2011) and Srikanth and Satish (2014) also observed that, the renal failure was more prevalent in Labrador followed by German Shepherd and lowest in Boxer, Doberman, Pomerarian and Pug each. Lothe (2018) was of the opinion that, the Labradors Retrievers and Pomeranians had highest incidence of renal disorders. Breed wise variation of renal disorders may be due to prevalence of particular breed in a particular geographical area.

Gender-wise Prevalence

In the present investigation, out of the 97 dogs, 55 (56.70%) dogs affected were males and 42 (43.30%) were females, thus the prevalence of renal failure in the present study was high in male dogs, which concurred well with Vasantha (2006) and Devipriya *et al*. (2018). This could be due to more presentation of male dogs at our clinics. Thade *et al.* (2019) reported prevalence of renal failure among 271 dogs, wherein 60.89 % dogs affected were males and 39.11 % were females. However on contrary, Srikanth and Satish (2014) and Tufani *et al*. (2015) reported highest prevalence of renal insufficiency in female dogs and Mshelbwala *et al*. (2016) observed no significant difference in the prevalence of renal failure in male and female dogs. Higher prevalence in males could be due to more risk associated with urolithiasis due to several anatomic characteristics (Bjorling, 2003). Another explanation for the results could be the effect of sex hormones on renal failure, estrogen is shown to have a protective effect over kidneys by inhibiting Renin-Angiotensin-Aldosteron System (RAAS), reducing glomerulosclerosis, reducing oxidative stress and slowing the progression of renal failure. Testosterone, on the other hand, is responsible for inducing RAAS (Gava *et al*., 2011). The results could also be attributed to preference of owners to keep male dogs as pets.

The study revealed that the renal failure in dogs in North Karnataka showed a low overall prevalence, with notable variation across districts. The condition was more common in middle-aged dogs, particularly between 5-10 years and showed higher occurrence in certain breeds such as Labrador Retrievers and German Shepherds. Male dogs were more frequently affected than females. These findings indicate that

age, breed predisposition, and gender-associated factors play significant roles in the occurrence of renal failure in dogs.

Acknowledgment

Authors are thankful to all the pet clinicians across the North Karnataka region.

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