Original Research Article

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Prevalence of Renal Anaemia in Nagpur City, India

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ABSTRACT

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Prevalence studies have been conducted with a view to establish a bench-mark about the burden of the disease with respect to clinical alterations, mortality rate and other indicators which helps to calculate the health investments in areas of target. This helps in evaluating the disease in terms of diagnosis and entails future sites of investigations. Studies on renal failure prevalence have been full-fledged as per the documentations. Similarly, renal anemia demands thorough investigations. Anaemia associated to renal failure in one year study from August 2018 to July 2019 concluded the occurrence of renal failure in 0.93 per cent cases, of which anaemia associated to renal failure accounted for 56.46 per cent. Labrador retriever was observed acquiring the topmost position with an overall percentage of 30.09 followed by Non-descript with 25.49 per cent. Spitz stood thereafter with 22.23 percent of anaemia associated to renal failure. The highest age of affection was between 6 years and upto 9 years (32.68%) followed by 9 years and upto 12 years (26.15%). There was no difference between both the sexes for the anaemia of renal origin.

Introduction

Renal anemia is one of the major consequences of renal failure which if aggravated, worsen the renal damage. This thus mandates prompt action. Renal anaemia often attracts less focus although must be bestowed equal consideration due to the former mentioned cause. Wintrobe *et al.*, (1974) mentioned that in renal failure, uremia occurs despite the deficiency of iron or folate. Additionally, uremia leading to the increased fragility of erythrocytes, shortened life-span of erythrocytes, gastro-intestinal bleeding in the

form of haematemesis, melena, toxic metabolites is responsible for anemia in uremia. The causes of renal anemia include deficiency of erythropoietin (Desforages, 1970; Sikole, 2000; Yamaguchi-Yamada *et al.*, 2004; Kaw and Malhotra, 2006 and Lankhorst and Wish, 2010) as the fundamental factor due to the damaged, non-functional nephrons (Bush, 1971) being incapable for erythropoietin production.

Considering the importance of the condition, the prevalence of this condition was studied and presented.

Materials and Methods

A total of 29159 canine patients were presented to TVCC, Nagpur Veterinary College, Nagpur, during the period from August 2018 to July 2019 for varying health issues as a part of routine evaluation, vaccinations, and other ailments and illnesses. Amongst them, 271 canines manifested renal failure indicating 0.93 per cent affection. The haematology of these renal failure patients revealed varying degree of anaemia in 56.46 per cent i.e. 153 canines. The anemia was graded as mild, moderate and severe on the bases on their haemoglobin concentration. Renal failure affected patients with haemoglobin concentration between 10 to less than 12g/dL were graded as mild, those with 8 to less than 10g/dL were categorized as moderate anaemia and the ones with haemoglobin concentration of less than 8g/dL was grouped as severely anaemic patients. In the current investigation, renal anaemia of mild, moderate and severe degree was recorded in 22 (14.38%), 61 (39.87%) and 70 (45.75%) canines, respectively in ascending order. The origin was mostly of severe nature thus highlighting the significance of this issue requiring urgent attention and thereby necessary therapeutic action.

Results and Discussion

Breed-wise prevalence

In the year of present study, Labrador retriever was observed acquiring the topmost position with an overall percentage of 30.09 followed by Non-descript with 25.49 per cent. Spitz stood thereafter with 22.23 percent of anaemia associated to renal failure. These breeds preceded German shepherd, Doberman, Dalmatian, Golden retriever, Pug, Rottweiler, Saint Bernard, Beagle, Belgian shepherd, Cross breed, Dachshund, Great Dane and Lhasa Apso (Table 1).

The breed wise prevalence of renal failure was reported to be highest in Labrador retriever as investigated by Kandula and Karlapudi (2014), Tufani *et al.*, (2015) and Nabi *et al.*, (2018). The relative difference in the breed-wise prevalence can be attributed to the distribution of particular breeds in the Nagpur city. Also Labrador being friendly and their ease of maintenance makes people fonder of them. The high population of stray pups has higher likelihood of adoptability by the animal lovers residing in and around the city which makes non-descript at the above said position.

Age wise prevalence

Highest prevalence was recorded in the age group between 6years and upto 9 years (32.68%) followed by 9 years and upto 12 years (26.15%). The listing could be due to the possible life-span of the observed breeds during the investigation. Sosnar *et al.*, (2003), O'Neill *et al.*, (2013), Bhojne *et al.*, (2016) and Nabi *et al.*, (2018) documented renal disorders in the particular age groups which co-relates to the pathology of anaemia associated to renal failure in the said age groups. In the age-wise listing, dogs below 3 years of age were affected with a rate of 11.11 per cent, familial renal dysplasia acting as the probable congenital pathology (Lucke *et al.*, 1980) (Table 2).

Sex wise prevalence

Assortment of disease must be carried out with respect to sex of the animal. This is essential as there exists vast variety of affections for specific sex. Renal failure occurrence was recorded by Kandula and Karlapudi (2014) and contemporary researcher Mukherjee *et al.*, (2014) documenting females with higher occurrence of cystitis and pyometra due to their short length of genitourinary tract. O'Neill *et al.*, (2013), Tufani *et al.*, (2015) and Nabi *et al.*, (2018) also had biased observations to females (Table 3).

Table.1 Breed-wise prevalence

Breed	Number of Dogs			
	Severe anaemia	Moderate anaemia	Mild anaemia	Total
Labrador	24(15.69)	16(10.46)	6(3.92)	46(30.07)
Non-descript	18(11.77)	16(10.46)	5(3.28)	39(25.49)
Spitz	14(9.15)	15(9.80)	5(3.28)	34(22.22)
German shepherd	3(1.96)	5(3.28)	1(0.65)	9(5.88)
Doberman	2(1.31)	2(1.31)	1(0.65)	5(3.27)
Dalmatian	1(0.65)	2(1.31)	1(0.65)	4(2.62)
Golden retriever	3(1.96)	0(0.00)	1(0.65)	4(2.62)
Pug	1(0.65)	1(0.65)	0(0.00)	2(1.31)
Rottweiler	0(0.00)	2(1.31)	0(0.00)	2(1.31)
St. Bernard	0(0.00)	1(0.65)	1(0.65)	2(1.31)
Beagle	0(0.00)	1(0.65)	0(0.00)	1(0.65)
Belgian shepherd	1(0.65)	0(0.00)	0(0.00)	1(0.65)
Cross breed	1(0.65)	0(0.00)	0(0.00)	1(0.65)
Dachshund	1(0.65)	0(0.00)	0(0.00)	1(0.65)
Great Dane	0(0.00)	0(0.00)	1(0.65)	1(0.65)
Lhasa Apso	1(0.65)	0(0.00)	0(0.00)	1(0.65)
Total	70(45.75)	61(39.87)	22(14.38)	153(100.00)

Figures in paranthesis indicate per cent

Table.2 Age wise prevalence

Age	Number of Dogs			
	Severe anaemia	Moderate anaemia	Mild anaemia	Total
Below 3Yrs	8 (5.23)	6 (3.92)	3 (1.96)	17 (11.11)
3 Yrs and upto 6 Yrs	12 (7.84)	9 (5.88)	8 (5.23)	29 (18.95)
6 Yrs and upto 9Yrs	25 (16.34)	21 (13.73)	4 (2.61)	50 (32.68)
9 Yrs and upto 12 Yrs	18 (11.76)	17 (11.11)	5 (3.27)	40 (26.15)
Above 12Yrs	7 (4.58)	8 (5.23)	2 (1.31)	17 (11.11)
Total	70 (45.75)	61 (39.87)	22 (14.38)	153 (100.00)

Figures in paranthesis indicate per cent

Table.3 Sex wise prevalence

Sex	Number of dogs			
	Severe anaemia	Moderate anaemia	Mild anaemia	Total
Male	39 (25.49)	32 (20.92)	6 (3.92)	77 (50.33)
Female	31 (20.26)	29 (18.95)	16 (10.46)	76 (49.67)
Total	70 (45.75)	61 (39.87)	22 (14.38)	153 (100.00)

Figures in paranthesis indicate per cent

Srinivasan *et al.*, (1993) and Bhojne *et al.*, (2016) on the contrary concluded their findings on renal failure in the favor of males. In contrast to their data, both males and females were equally affected among a total of 153 dogs suffering from anaemia associated to renal failure.

In conclusion, the anaemia in dogs suffering from renal failure can be observed at varying degrees. This can range from mild, moderate to severe anaemia. However, in the current investigation, anaemia of severe grade was highly prevalent with a rate of 45.75 percent i.e. 70 of 153 dogs suffering from anaemia associated to renal failure. According to the distribution of the breeds in a particular geographical area, the breed prevalence may vary. In the Nagpur city, Labrador retriever was highest preceding Non-descript breed in the prevalence listing. Dogs aging 6 years and upto 9 years suffered the most with 32.68 per cent rate of occurrence. Categorizing the prevalence according to sex, both males and females stood equally in the present investigation.

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